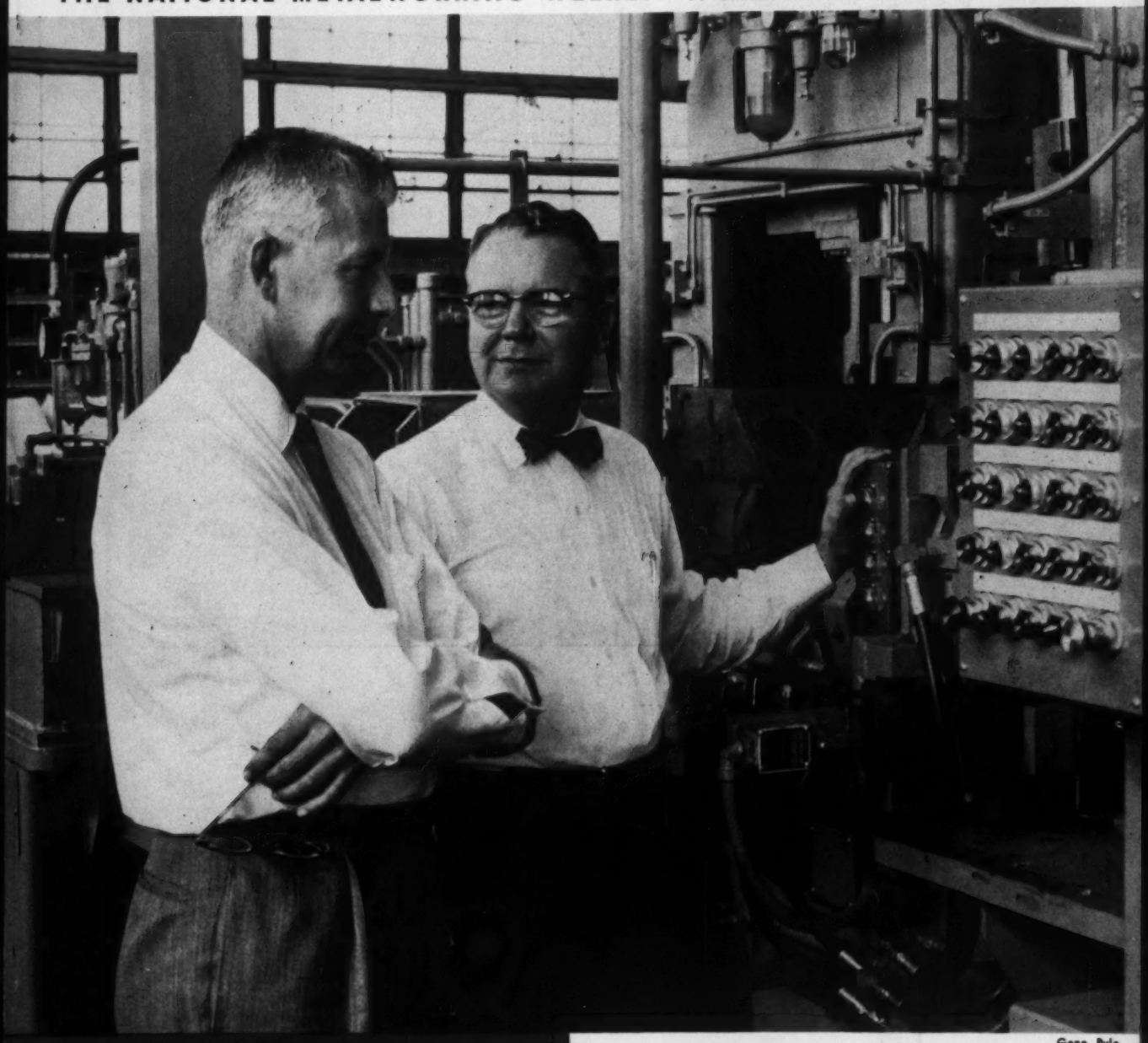
IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication JULY 21, 1960



Gene Pyle

★ Snyder Corp.'s Maynard and Gajda

New High-Speed Machine De-fins Castings ... p. 131

Executive Demand Eases p. 93

What's Ahead in Steel Labor? p. 96

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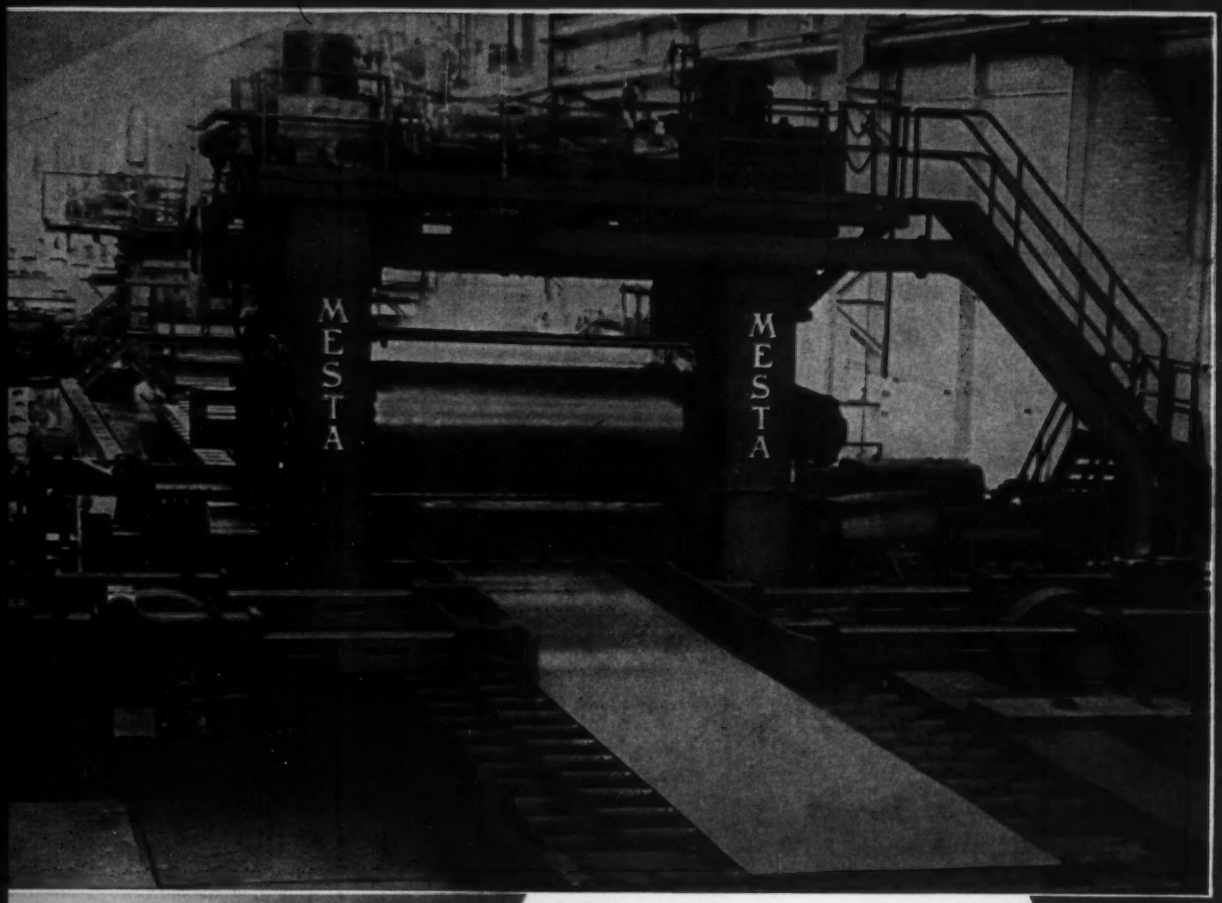
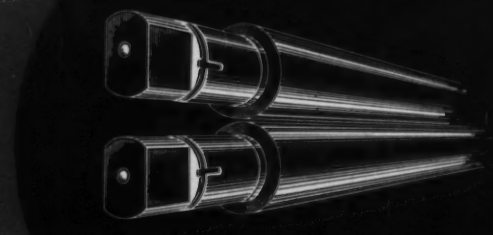


MESTA 132" FOUR-HIGH REVERSING PLATE MILL OPERATING
AT SOCIETE ANONYME COCKERILL-OUGREE, BELGIUM

PLATE MILLS

Designed and Built by MESTA



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Now 6 out of 7 ironing "boards" are made of sheet steel

Just fifteen years ago, all but 15 per cent of ironing boards were made of wood. Today, it's the other way around: 6 out of 7 are made of strong, durable, inexpensive sheet steel, with features that could never be achieved with wood.

"The Mary Proctor Hi-Low Ironing Table" shown here is a good example. Its steel top is pleated for extra strength, with steam vents that channel heat away from the ironer's lap for cooler ironing. Sturdy tubular legs rolled from sheet steel are light in weight yet provide solid support.

Bethlehem furnishes large tonnages of cold-rolled steel to the Proctor-Silex Corporation, makers of the "Mary Proctor Hi-Low Ironing Table."

If you work with steel sheets—hot-rolled, cold-rolled, or galvanized—you can always count on Bethlehem sheets for completely dependable performance. Our engineers will be glad to discuss your sheet-steelworking problems with you.

Steel

For strength
. . . economy
. . . versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *Export Distributor: Bethlehem Steel Export Corporation*

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The IRON AGE

July 21, 1960—Vol. 186, No. 3

Digest of the Week in

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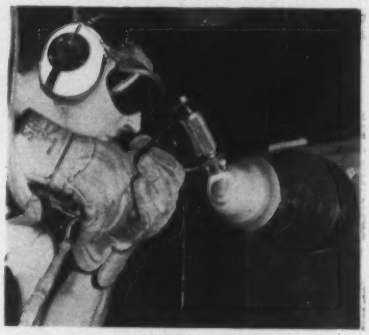
News of the Industry

HUNT FOR EXECUTIVES

Is Slowdown Temporary?—Some executive recruiters say downturn in demand is only temporary. But right now, the search for some types of executives has slowed. P. 93

PLASMA ARC

High Temperature — Makers of plasma arc guns say they are having their biggest sales year. The guns,

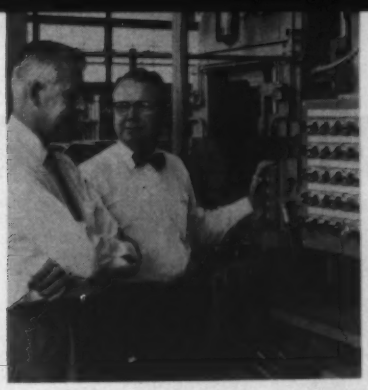


operating at very high temperatures, are used for coating and cutting metals. P. 95

STEEL LABOR

Issues Unsolved—Many of the issues of the 1959 steel strike were not settled in the agreement. Most of them will be alive again in 1962. Meanwhile, the steel industry plans a giant program of worker education through direct communication. It hopes to bypass the union in direst appeals to the worker. P. 96

Metalworking



Cover Feature

FOUNDRY AUTOMATION: Snyder Corp.'s president, H. N. Maynard (right), and top engineer, Leo Gajda, put a new automatic de-finning machine through a shakedown run. The machine removes sprues and fins from automotive engine blocks. P. 131

AUTOS AND INVENTORIES

Time of Decision—What happens to auto sales in next few weeks will have a lot to do with fourth quarter plans. Inventories of unsold 1960's are a problem. Some steel for August has already been set back into September. However, automakers are looking for a new business spurt. P. 107

Engineering-Production Developments

ULTRASONIC BATH

Cleans Stainless Tubing—There is no margin for error in the manufacture of bent-tube assemblies for fuel and hydraulic systems in supersonic aircraft. Parts must conform to tight design specs. They must also be free of foreign matter. Ultrasonic cleaning guarantees the cleanliness required. P. 134

PLANNED PROFITS

Evaluate Production — The day has passed when a production manager is able to make safe judgments from the facts at his finger tips. Now the harvesting of profits depends on fringe areas. Ratio analysis provides the key to making the best of available facts and figures. Formulas predict profits. P. 136

DUPLEX MILL

Keys Motor Shafts—Duplex half-mills combine cutting operations and place a saving on both time and labor. These mills may be just the units to cut your setup time. They are capable of slotting, sawing and face and slab milling. Spindle speeds are 360 rpm. P. 139

FASTENER LOCKS JOINTS

Withstands High Heats—A new nut-bolt combination withstands up to 200,000 psi at 900°F. Mechanical properties run 15-25 pct higher than the strongest previous 900°F bolt-nut joints. This means the newcomer can effect aircraft and missile weight reductions. P. 140

STEEL ROLLING MILL

Takes on New Look — Programmed drive and control systems integrate the complex operations of a steel rolling mill. A punch-card system speeds 21 passes through all five stands at 1500 fpm. P. 142

Market and Price Trends

ALUMINUM SHAKEOUT

Is One Coming?—Despite stiff competition and excess capacity, prices may soon go up on some aluminum products. Profits are already tight, but wages will go up next month. P. 98

VACUUM-CAST ROLLS

An Entire Line — Bethlehem Steel Co. is now making its entire line of hardened steel rolls from vacuum-cast ingots. Better performance is claimed. P. 99

MACHINE TOOLS

Period of Progress—New Gisholt turret lathe is an example of machine tool industry's progress. Faster production, greater versatility are some features. P. 115

STEEL SUMMARY

Orders Lag—Causes of the slump in steel are deeper than seasonal factors and inventory control. Order lag will continue into fall. P. 189

PURCHASING

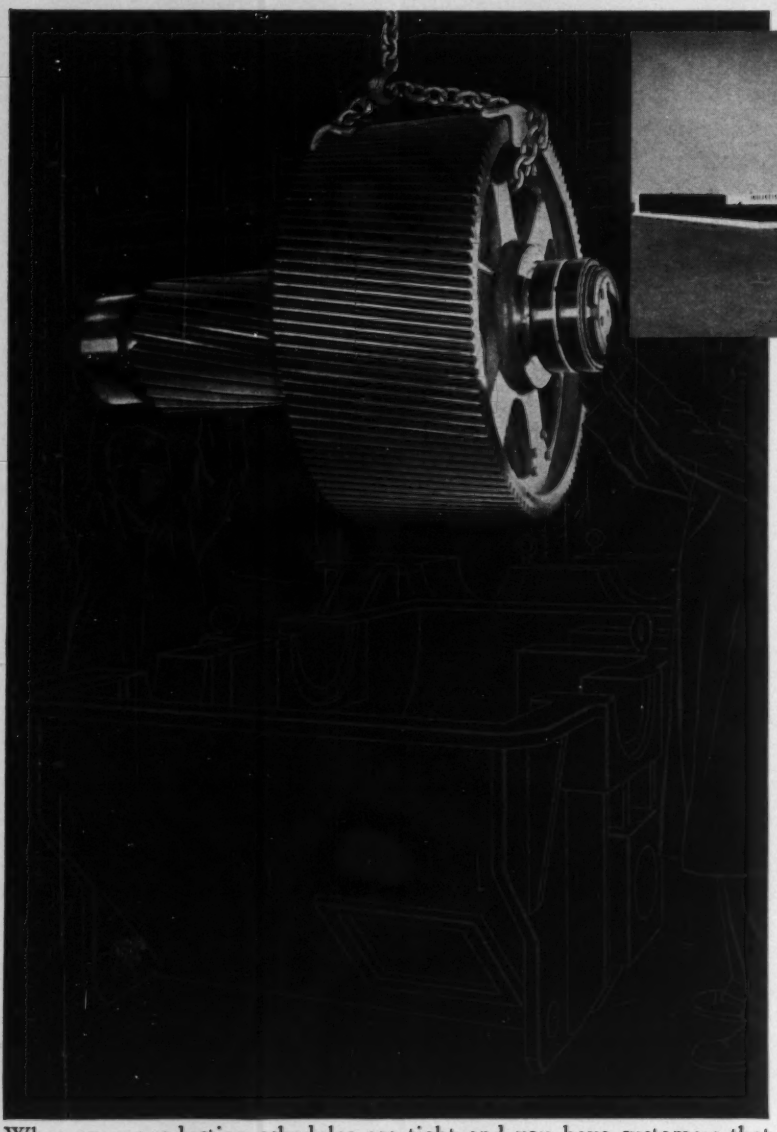
Drop Coming?—Tool and diemakers say business may drop 10 pct later this year. But even if this happens they will still be about 15 pct ahead of 1959. P. 190

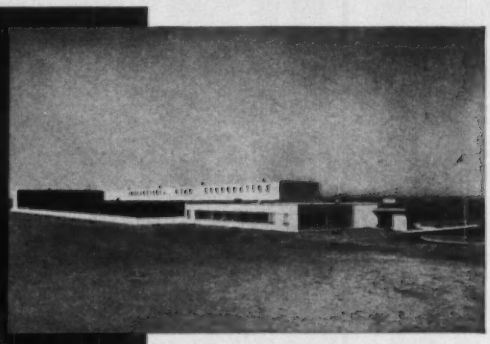
NEXT WEEK

EUROPE'S GROWTH

Challenge to U. S.—What will be the impact of Europe's Common Market on the U. S.? Next week, Chase Manhattan Bank's David Rockefeller (far right), discusses the long-term challenge of the ECM.

INSTALLED...ON SCHEDULE!





When your production schedules are tight and you have customers that can't wait, delivery can be your most frustrating problem. So if you're looking for gearing, delivered on time, you can find the answer in Philadelphia's new and greatly expanded facilities. We are equipped to give better service than ever before on all types of gearing . . . spur, helical, helical internal, rack, herringbone, worm, coniflex bevel, spiral bevel, zerol, hypoid, splines and sprockets.

NEW PHILADELPHIA GEAR PLANT MEANS BETTER SERVICE

New Philadelphia Gear plant at King of Prussia (Suburban Philadelphia), Pa. One of the world's largest integrated gear manufacturing plants.

FACILITIES

Unequalled production facilities plus a vast stock of standard patterns permit us to supply sizes and types of gearing for almost any requirement of performance and price.

QUALITY CONTROL

Philadelphia advanced manufacturing methods are backed by the most complete quality control facilities in the industry. You are assured of the highest quality standards whether you need one gear, half a dozen or a production run.

CUSTOMER SERVICE

Whatever your needs . . . standard or special . . . our engineering staff is ready to work with you in finding a better solution to your gearing problems.

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Write for our comprehensive gearing catalog G-127.

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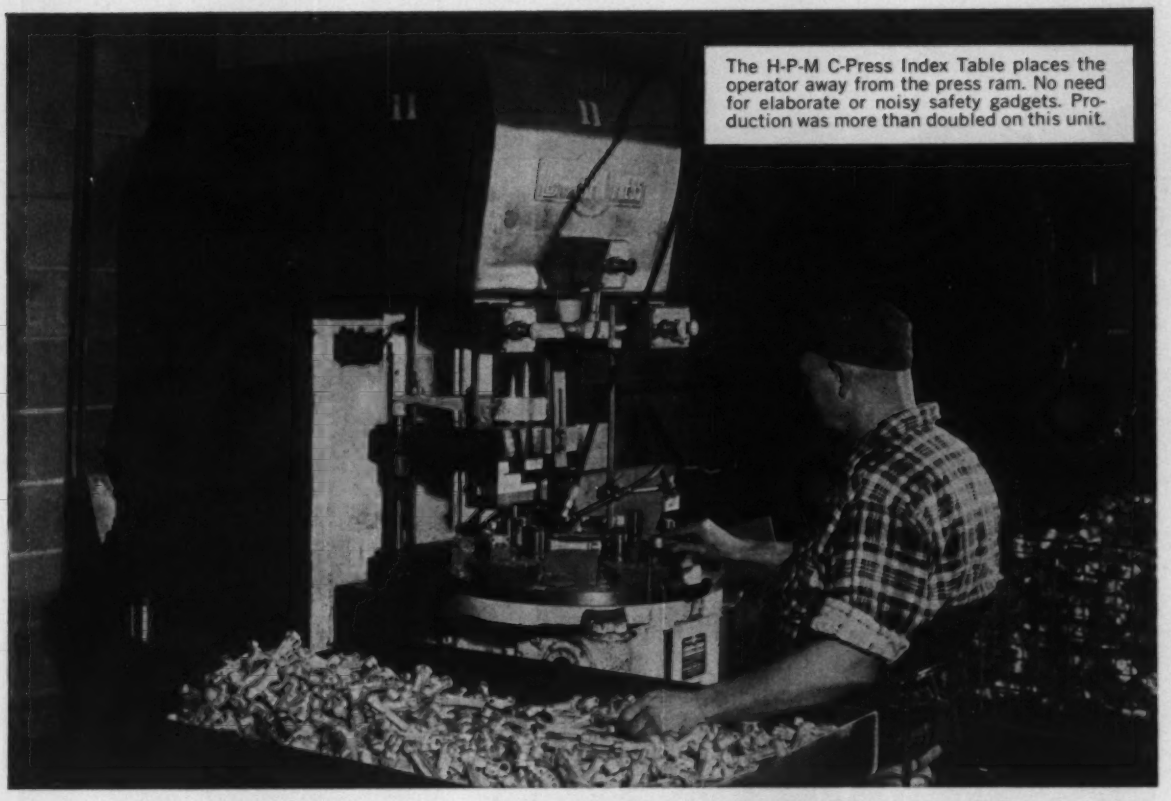
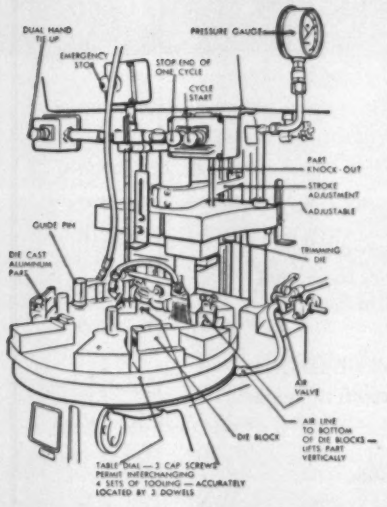


The H-P-M C-Press Index Table places the operator away from the press ram. No need for elaborate or noisy safety gadgets. Production was more than doubled on this unit.

H-P-M C-Press with Hydraulic Index Table
BASIC AUTOMATION AT ITS BEST


DUAL HAND TIE UP
PRESSURE GAUGE
EMERGENCY STOP
STOP END OF ONE CYCLE
CYCLE START
PART KNOCK-OUT
STROKE ADJUSTMENT
ADJUSTABLE
GUIDE PIN
DIE CAST ALUMINUM PART
TRIMMING DIE
AIR VALVE
AIR LINE TO BOTTOM OF DIE BLOCKS — LIFTS PART VERTICALLY
DIE BLOCK
TABLE DIAL — 3 CAP SCREWS PERMIT INTERCHANGING 4 SETS OF TOOLING — ACCURATELY LOCATED BY 2 DOWELS

Standard 15-ton C-Press with 6-station index table. 5, 10, 15-ton models with 6, 8 or 12 station tables available. A solid money-making investment for faster, safer metal working.

The job illustrated is tooled for the trimming of die cast parts. Its high-production capacity can be applied to any number of routine production tasks. Look at these versatile features: (1) The index table allows the operator to load parts away from the press ram—in safety and comfort, no wasted waiting time while ram cycles; (2) As many as three operators may be located around this small table for assembly or other operations; (3) Automatic ejection, using air from shop lines makes an effective and time saving contribution to faster production; (4) The die blocks or holding fixtures are located at six stations on this unit. Table dials are dowelled in position for accuracy — may be removed so that different tooling set-ups are replaced in a matter of minutes. Production can be tripled with this type of C-Press.

SAFETY ASSURED WITH C-PRESS METHODS

The operator sits in front of the dial away from moving ram. Fixtures are loaded as they pass his station and are automatically indexed to the next station. Hands never enter the danger zone.

An investment of this type is amortized in minimum time. Want to know more? Write or call H-P-M today. The coupon will assure complete information, immediately.

The Hydraulic Press Mfg. Company, Mount Gilead, Ohio

Please send complete information on the H-P-M C-Press with Index Table. I'd like to triple my production, too.

Name_____ Title_____

Address_____

Company_____

City_____ Zone____ State_____

H20

MMT-PE

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THE HYDRAULIC PRESS MANUFACTURING COMPANY

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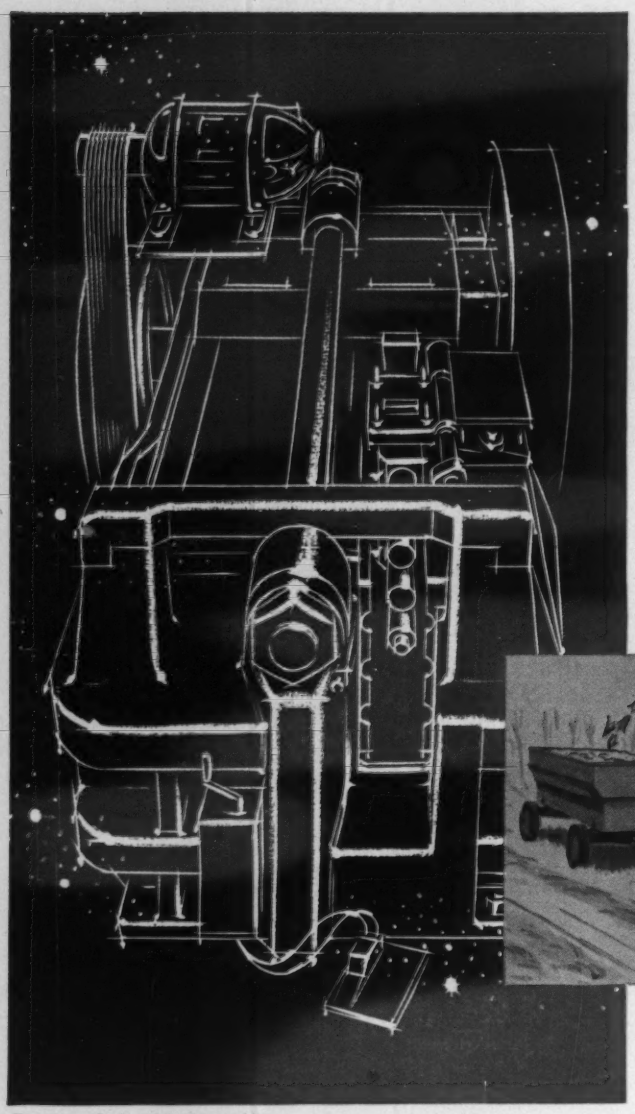


RESISTANCE TO PUNISHMENT of any severe-service part increased by designing it to be forged

Upsetter, or horizontal forging machine

Gear blanks for tractor and farm implement transmissions are designed to be upset-forged, usually with integral forged stub shafts. Forging gives these vital parts maximum resistance to gear-clashing shifts. Transmission life can be equal to equipment life when gears are FORGED.

When you *design with forgings* right from the start, you take full advantage of the many benefits which only forgings offer: highest ratio of strength to weight . . . highest resistance to impact, shock, vibration, torsion . . . preferential orientation of flow lines in the forging to concentrate strength where required . . . absence of wasteful inclusions and voids.

Forged parts start out as *better* metal . . . are made *even better* by the hammer blows or pressures of the forging process. Write for literature to help you design, specify, and procure forged parts.

When it's a vital part, design it to be FORGED

Drop Forging Association • Cleveland 13, Ohio

Names of sponsoring companies on request to this magazine

Inventory Controls: Just How Good Are They?

Anyone who recklessly reduced his inventory to zero might go broke, get fired, or gain valuable experience. The same goes for anyone who built his inventory far too high.

It is quite a fad now to keep inventories under strict control. There is nothing new in this. For years, firms have striven to walk this tight rope.

One difference today may be the electronic monsters which answer all the questions. They tell management how much stock it has, and whether it is moving fast or slow. Some of these machines tell when to buy and when not to buy. Of course, such advice is statistical and is based on assumptions fed into the machines.

But the electronic gadgets will not think. They may recall, but they only recall what is set up for them in the initial "problem." The real judgment has to come from people. And when it comes to inventory questions, assumptions, and decisions, it takes a certain kind of people.

Management men who make the decisions on inventories can make or break relationships the company has with its customers. Having enough stock to meet all emergencies, while at the same time not wasting money and space, is not for babies, laggards, or hot-shots.

Usually the final decision—or policy—on inventory problems must be made by the top man. His is the experience which counts after the machine patterns and figures have been analyzed.

These days the boss has to know quite a few things in order to be ahead of the parade with his inventory policy. He must certainly know his own markets and trends. He must know something about economics or have someone in tow who does. Even crude estimates are better than catch-as-catch-can tactics.

Management needs a working knowledge of government if it is to keep its inventory actions in line with reality. The boss has to—or get someone who will—keep abreast of international affairs. One fast move by a Castro or a new African headman could make a shambles out of a fine, statistical and "logical" inventory pattern.

In other words, management has to know its stuff. Inventory control depends on sound human decisions. It usually succeeds when the customer can get what he wants—when he wants it.

You can still control your inventory and maybe lose a lot of important customers.

Tom Campbell

Editor-in-Chief

PRODUCT INFORMATION

N/D sound booth for analysis of electric motor noise, mounted on springs and constructed with non-parallel walls, assures manufacturers a *scientific solution* to electric motor noise problems. Motors are tested with special electronic sound evaluation equipment.

How N/D Minimizes Electric Motor Noise!

In New Departure's full-time noise analysis program, a unique sound booth and special electronic sound level equipment are used to pinpoint and evaluate electric motor noise. Inside the booth, a condenser microphone picks up air-borne noise from the running motor. Outside, the signal is electronically registered and recorded.

By changing one variable at a time, such as bearing or mounting design, or lubricant, N/D engineers are able to select the proper combination that results in the quietest motor operation. That's why you'll find New Departure precision ball bearings specified for electric motors to be used in quality home appliances, instruments, fans, hand tools and other applications . . . for greater consumer sales appeal.

If you have an electric motor noise problem, contact the N/D Sales Engineer in your area. For additional information call or write New Departure Division, General Motors Corporation, Bristol, Connecticut.

NEW DEPARTURE

BALL BEARINGS

proved reliability you can build around

Forms Molybdenum Foil

Hydroforming, in which a single male die is used with diaphragm and hydraulic pressure has been successful in forming production lots of new foils. They are now available in refractory metals. A midwestern company is forming molybdenum foil by this method and will seek to bid on other foil jobs using the same methods.

RussiansDemandMoreTools

Russian sources indicate that strong demands are being made of their machine tool industry. The purpose is to reduce the size and weight of gear transmissions. Demands include: improved quality and accuracy of gear cutters; more grinders for the special Novikov gears; and added facilities for machining and finishing gears with internal, straight and helical teeth.

Stamps Cleaner Edges

Soon to be announced is a new blanking process that will turn out smooth, straight edges, without the usual heavy burrs. This clean-shear development hinges on special dies and a triple action, high-speed hydraulic press. Process is reported to sharply cut stamping costs.

Controls Blast Furnace

Thermocouple wires made of platinum and rhodium are helping blast furnaces turn out more iron at lower cost. The measuring heat devices allows the furnaces to operate closer to the temperature at which the life of its lining is reduced excessively—about 2000°F. The hotter air blasts results in fast, economical output.

Improved Superalloy

An improved colbalt-base high tungsten superalloy is said to greatly improve high-temperature strength in the 1800°F range. Coupled with this is good ductility and corrosion resistance. Improved refining methods and precise control of alloying elements are factors. Rupture life is raised 18 pct; rupture elongation by 160 pct at the elevated temperatures. Possible uses include; tools for hot-forming work and investment-cast turbine blades and vanes.

Checks on the Theory

Lab men are the first to admit that their theories are not always practical for production. Industrial research is setting up pilot stations to serve as checkpoints. This will iron out the rough spots before the job hits production. Blunders if any, will be on a small scale allowing profits on a large scale. The iron and steel researchers are making this a unified effort.

On-Line Chemical Analysis

Multi-element analysis of materials in a steady flow—never before possible—has been born. A new X-ray gage promises to move industrial chemistry from the lab to the production line. The newcomer analyzes liquids, solids, slurries, and dry or moist powders. Measured radiation from an element reflects the amount of that element in the material being checked. Up to six elements can be checked at the same time.

Alloy Resists Corrosion

Samples of commercial titanium and titanium-0.2 pct palladium alloy have been suspended in boiling 5 pct sulfuric acid. The commercial titanium was removed after 85 hours because of excessive corrosion. But tests on titanium-palladium continued for 170 days and showed a very low corrosion rate.

Increases Solder Life

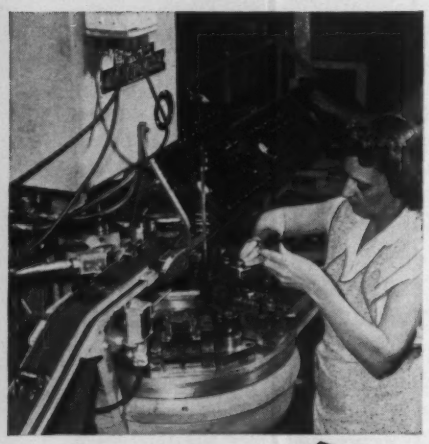
One result of recent work on solderability at the Tin Research Institute is that a minimum of 0.0001 in. nickel undercoating improves solderability. No deterioration is seen after long storage periods. But the final coating must be applied without delay.

Denison, Denison HydrOILics, and Multipress are registered trademarks of Denison Eng. Div., ABSCO

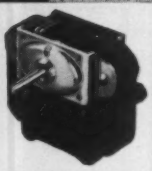
DENISON HydrOILics

DENISON Multipress installation pays off for BARBER-COLMAN with faster, simplified small motor assembly that...

CUTS COSTS



DENISON 4-TON HYDRAULIC MULTIPRESS *is used by Barber-Colman to assemble low-cost precision AC motors.*



PREDICTED cost cuts have been *confirmed* by the installation of three Denison Multipresses at Barber-Colman Company in Rockford, Illinois.

Justified by MAPI (Machinery and Allied Products Institute) formula analysis, these presses operate in a line connected by belt conveyors. Semi-automatically, Multipresses perform bending, staking, aligning, compressing, riveting and stamping operations in the production and assembly of small precision electric motors.

In addition to more efficient handling of production functions, other Multipress *bonus benefits* include—product uniformity... reduced scrap loss... rapidly adjustable stroke length and pressure for faster, simpler set-up... longer die life to lower tooling costs and downtime.

Duplicate these savings and bonus benefits in your plant today! Your Denison Production Specialist can show you how with a **M**ultipress **A**nalysis **P**rogram that can **MAP** new savings for you now.

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MODERN MACHINE TOOLS MMT=PE PRODUCTION EFFICIENCY

1960 Machine Tool Exposition
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DENISON
HYDRAULIC MULTIPRESS

LETTERS FROM READERS

Worthy Importance

Sir—Your IRON AGE issue of May 19, 1960 had a very interesting article on your "Make or Buy" report, called "Screw Machines Don't Always Pay." Because we are in the screw machine industry, we would appreciate your kind assistance by forwarding two or three copies of this article. Perhaps, it may be more practical to forward us several copies of that issue. We feel it is a report of worthy importance for our industry, therefore, it is hoped that our request will be fulfilled promptly.—D. A. D'Ambrosio, Wood-Mor Products Co., Inc., Rochester, N. Y.

▪ **Copies have been sent.—Ed.**

Needs Address

Sir—In the June 9th issue of IRON AGE there is an article on page 150 about casting clinics which the Gray Iron Founders Society is sponsoring. Will you please advise where the Gray Iron Founders Society can be contacted for this information.—W. H. Parlette, Morton Grove, Ill.

▪ **The address is: National City E. 6th Bldg., Cleveland 14, O.—Ed.**

Information Please

Sir—Your issue dated June 23, 1960 mentioned on page 83 a low pressure die casting process referred to as the "European Process". Where can I obtain some detailed information concerning the application of this process?—John Wedlich, General Electric Co., Tyler, Tex.

▪ **Write to: Karl Schmidt Co., Hamburg, Germany.—Ed.**

Possible Citation

Sir—It is my understanding that you have a reprint of a special study entitled "Are Excessive Marketing Costs Draining Your Profits?" Could you provide us with a copy of this study for possible review and citation in the forthcoming revision of our basic university textbook, "Principles of Marketing."—William R. Davidson, Ohio State University, Columbus, O.

▪ **Copy has been sent.—Ed.**

Wants Reprint

Sir—We would very much appreciate receiving a reprint of the article entitled "New Process Alloys Steel While in Coiled Form" which appears on pages 73-75 of the July 7, 1960 issue of IRON AGE.—R. L. Pope, Union Carbide Metals Co., New York, N. Y.

▪ **Reprint is on the way.—Ed.**

Congratulations

Sir—Again let me extend my congratulations to you on your very excellent editorial, "The Nation Comes of Age." It is most pointed and timely.—G. G. Beard, United Engineering and Foundry Co., Pittsburgh, Pa.

Hot or Cold

Sir—I would like to congratulate you on your excellent editorial in the IRON AGE, July 7, entitled "Russia vs China?" You are one of the few people who have correctly analyzed the so-called "falling out" of the two major leaders of the Communist conspiracy. Most people, even many who are more or less aware of the problem of Communism, seem to have forgotten that both Khrushchev and Mao Tse Tung are simply and purely Communists. Any external wrangling or public display of differences in ideology is of no consequence when the overall aim of world conquest is considered. It does not really make much difference whether the war is hot or cold, the fact remains that the ultimate goal is world domination, and the results would be just as final.—D. N. Haley, New Bedford, Mass.

For The Best BULK PACKAGING

STANDARDIZE 100% ON SOUTHERN FASTENERS

Southern Screw's industry-acclaimed bulk packaging system will save you valuable handling time, regardless of whether your materials movement is mechanical, manual or power driven.

Heavy, 275# test 9" x 9" x 6½" cartons with telescopic top are securely bound with single wire which can be cut for quick, easy access to screws without damaging cartons. Thus tops and bottoms of cartons are usable on two production line stations; can be re-closed and re-used as often as desired.

Quantity shipments are made in units of 36 cartons steel strapped to 30" x 30" two-way entry free pallet. Your shipment arrives ready for ceiling-high storage, or can be quickly disassembled for use at assembly line stations.

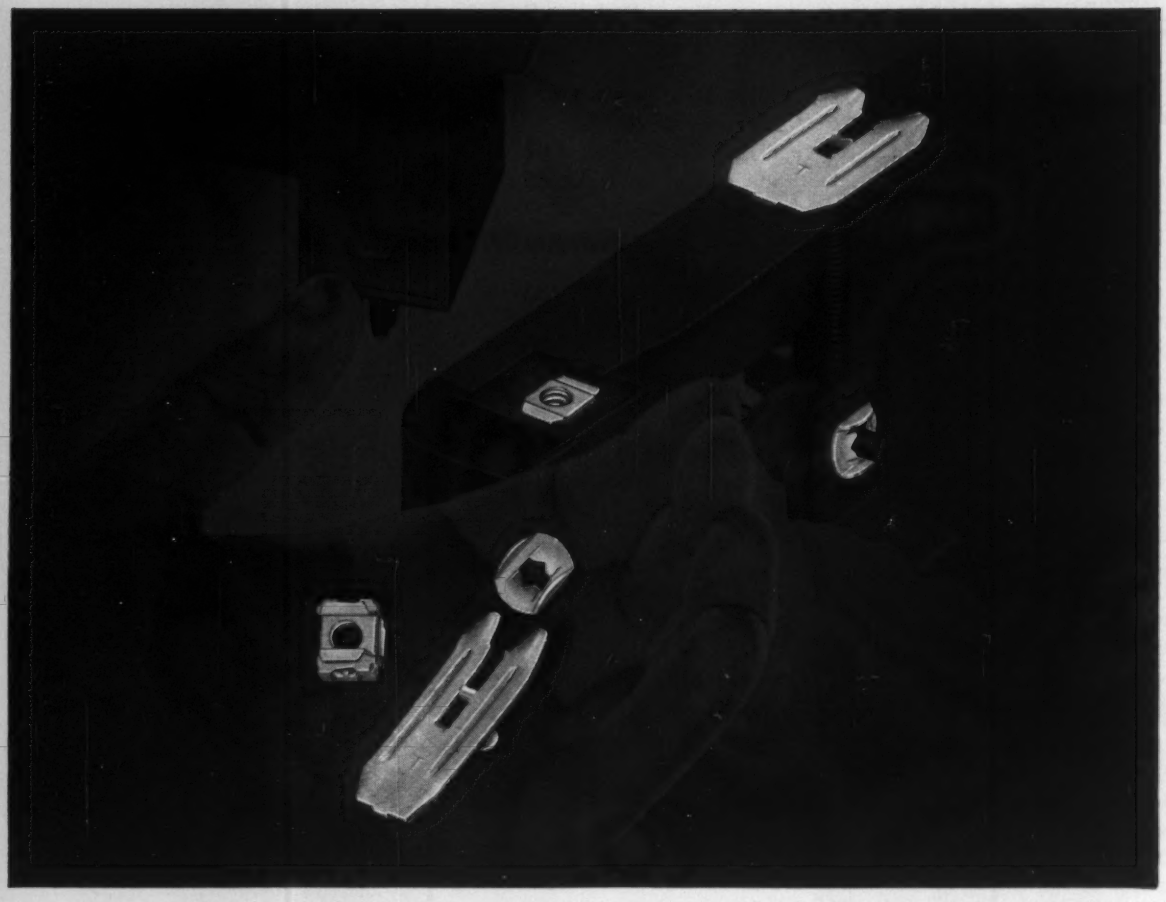
Write, asking for Chart BP-2, telling about standard quantities for each size of machine screws and tapping screws. Address Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.

Manufacturing and Main Stock in Statesville, North Carolina

Warehouses: New York • Chicago • Dallas • Los Angeles

Machine Screws & Nuts • Tapping Screws • Wood Screws • Stove Bolts • Drive Screws Continuous Threaded Studs • Carriage Bolts

Southern SCREW COMPANY STATESVILLE • NORTH CAROLINA



Assembly costs cut 50% at design stage by Tinnerman **SPEED NUT**® Brand Fasteners!

Fastener ideas worked out between designers at Hillside Metal Products, Inc., and Tinnerman engineers, resulted in the selection of 3 different SPEED NUT types for Hillside's complete line of quality steel office furniture. Hillside estimates "at least a 50% saving in material costs, assembly time and tooling" over ordinary fastening methods. And spring-steel SPEED NUTS hold tight, even through years of hard service.

A special Dart-Type SPEED CLIP® snaps into a punched hole, securely anchors one end of the drawer latching mechanism spring. A standard Push-On SPEED NUT "bites" into a stud; prevents the other spring end plus latching bar from backing off. Desk tops as well as desk and table legs, are attached with the help of SPEED GRIP® Nut Retainers that snap into bolt-receiving position in punched holes. A Push-On completes the file drawer follow block assembly; two more secure each filing cabinet drawer card holder.

This should give you an idea of what a free Fastening Analysis can probably do for you in savings and improvements on present or new products. Look up your Tinnerman representative in the Yellow Pages under "Fasteners". Or write to

TINNERMAN PRODUCTS, INC.
Dept. 12 • P.O. Box 6688 • Cleveland 1, Ohio

TINNERMAN
Speed Nuts®

FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

FATIGUE CRACKS

A Saucy Ship

Her shakedown over, the Jigmil IV slips through the waters of the Great Lakes as she heads for home port at the Grosse Pointe, Mich., Yacht Club.

It is the world's largest aluminum yacht and runs at 22.8 mph. The 72-ft 2½ in. vessel was built for Royal Oak, Mich., industrialist, Charles B. DeVlieg. Mr. DeVlieg, a long-time sailor, wanted a boat that would set new performance standards in the boating world.

Her Namesake—It's named after the jig-mil he invented in 1941, and which since has become a fundamental metalworking tool.

For the building of the boat, the Burger Boat Building and Reynolds Metals companies were called in. To this team were added naval architect, J. B. Hargrave, and the experienced Jigmil's captain John Borgen.

Floating Hotel—Into the construction went 17½ tons of aluminum. The sleek vessel is powered by twin V-12 GM diesel engines, each having 456 net rated hp.

This fall Mr. DeVlieg will take the Jigmil IV on a cruise to Florida.

In the meantime, she will be used for business conferences for customers of the DeVlieg Machine Tool Co.

To Your Health

Special high strength steel is now playing a part in life saving.

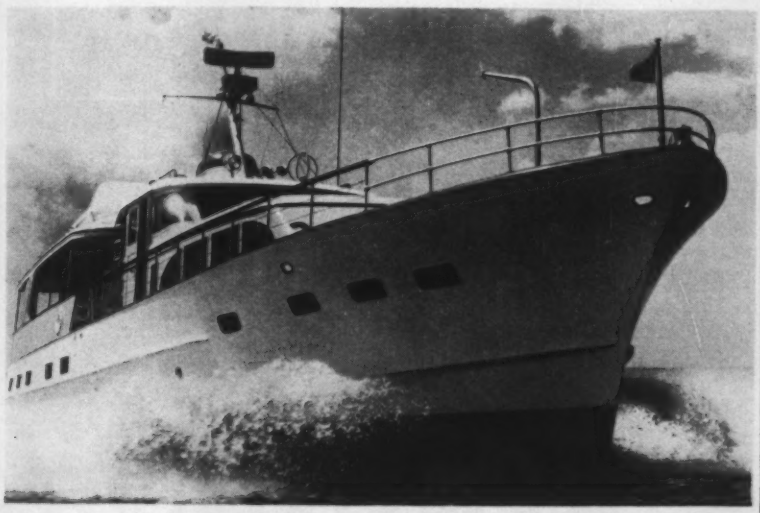
National Steel Corp., after six years of research, has developed a ball-shaped refillable container for oxygen. The compactness of the sphere allows an hour's supply of oxygen to be easily carried and used in emergencies. It weighs only 2 lb. This is in contrast to bigger units weighing as much as 125 lb.

It is designed for plant use as well as for doctors' offices.

To develop the new steel, National's Great Lakes Steel Div. added precise amounts of columbium to its steelmaking process.

No Such Luck — The oxygen spheres are being marketed by Breath O' Life, Inc., Cleveland.

And Breath O' Life says it has had a number of queries questioning the device's possible use as a cure for the dreaded hangover "that may come from excessive alcoholic - beverage consumption." But they are reluctant to answer these except to comment dryly that modern day living probably has magnified possible uses for emergency oxygen.



AHEAD FULL: The aluminum yacht, Jigmil IV, speeds through the waters of the Great Lakes. She hits over 22 mph.

STRAITS TIN REPORT

News of developments in the production and uses of tin

MALAYAN TIN BUREAU

Alpha-titanium, containing 2.5% tin, is the structural material used for the X-15 manned spaceship. Addition of tin provides greater creep resistance. This alloy is widely used in aircraft applications. It has the characteristics of high-grade steel, but only half the weight.

Tin alloys may be used as hot-dipped or electrodeposited coatings on other metals or they may be cast as the base metal. Use of tin will result in one or more of these characteristics being added to finished products:

- malleability • nontoxicity
- lubricity • corrosion resistance
- solderability • wear resistance
- excellent bearing qualities
- ductility • attractive finish

Tin is commonly alloyed with copper, lead, antimony, bismuth, aluminum or iron; less commonly with nickel, cadmium, magnesium, zinc, mercury, silver, manganese, tellurium.

Electronic components use tin in many applications. Transistor leads and caps are tinned. Tin-indium solder joins glass to metal, glass to glass. Printed circuits use 60-40 tin-lead solder. Potentiometer brush arms and springs are made of tin-containing spring-temper phosphor bronze. A tin chemical, bismuth-stannate, stabilizes capacitors against temperature change.

Write today for more data on these items or for a free subscription to TIN NEWS—a monthly bulletin on tin supply, prices and new uses.

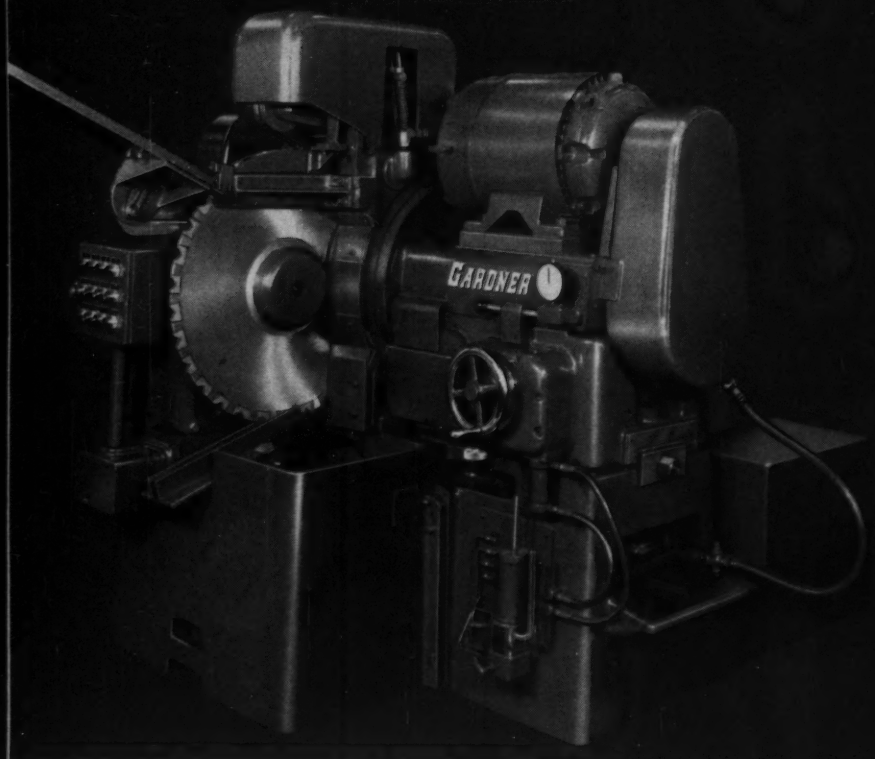
The Malayan Tin Bureau
Dept. 54G, 2000 K Street, N.W., Washington 6, D.C.

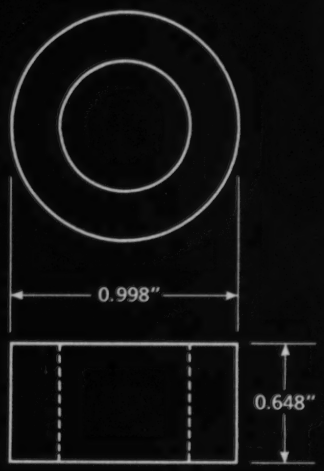
NEW GRINDER TRIPLES OUTPUT

Gardner 2H20 grinds more magnets in ⅓ the time

In this installation it is grinding 3,966 #5 magnets—taking 3 passes on each part—in one 8-hour shift. This is more than the old machine was producing in three 8-hour shifts.

The new 2H20 is the latest addition to the Gardner 2H line of precision double spindle grinders.





Stock removal .030" per pass.
Three passes per part.

MMT PE

GARDNER

precision disc grinders

BELOIT, WISCONSIN

COMING EXHIBITS

Machine Tool Exposition—Sept. 6-16, International Amphitheatre, Chicago (National Machine Tool Builders Assn., 2139 Wisconsin Ave., Washington 7, D. C.)

Production Engineering Show — Sept. 6-16, Navy Pier, Chicago, (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Coliseum Machinery Show — Sept. 7-15, Chicago. (Contact: A. B. Perkins, 2216 South Hill St., Los Angeles 7, Calif.)

Iron & Steel Show — Sept. 27-30, Cleveland Public Auditorium, Cleveland, O. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22.)

Metal Show—Oct. 17-21, Convention Hall, Philadelphia. (American Society for Metals, Metals Park, Novelty, O.)

Die Casting Exposition & Congress —Nov. 8-11, Detroit Artillery Armory, Detroit. (The Society of Die Casting Engineers, 19382 James Couzens Highway, Detroit 35.)

MEETINGS

JULY

American Electroplaters' Society—Annual convention, July 24-28, Statler Hotel, Los Angeles. Society headquarters, 445 Broad St., Newark, N. J.

SEPTEMBER

American Machine Tool Distributors Assn.—Annual meeting, Sept. 3-4, LaSalle Hotel, Chicago. Association headquarters, 1500 Massachusetts Ave., N. W., Washington 5, D. C.

Assn. of Lift Truck & Portable Elevator Mfrs.—Fall meeting, Sept. 12, The Cavalier Club, Virginia Beach, Va. Association headquarters, One Gateway Center, Pittsburgh 22, Pa.

Electronic Industries Assn. — Fall conference, Sept. 13-16, French Lick-Sheraton, French Lick, Ind.

(Continued on P. 16)

"Call FOSTER for track . . . PLUS"

Whether you call for a big shipment of "high iron" or a single guard rail, Foster gives you track "plus"—all the rail you need, and all the accessories and tools to complete the job.

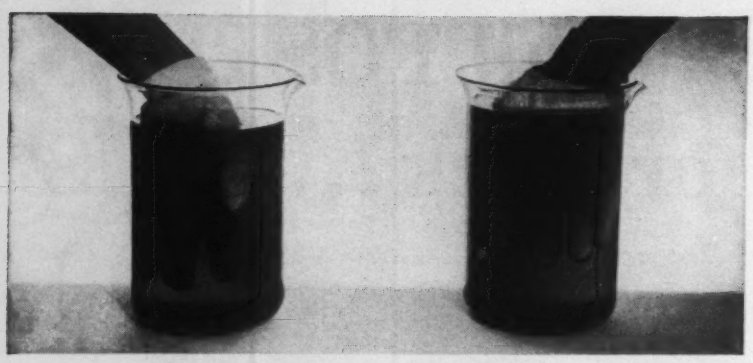
You can get any standard rail sections including lower-cost Foster Quality Relayers, frogs, switches, tieplates, accessories, tool cars and dollies, hand tools, gauges, levels and other track items including CRANE RAIL. We will also supply steel-sheet piling and construction products for maintenance-of-way.

Another "plus": Foster's warehouses are located all over the country, all carry large stocks. So you get the advantage of "complete package" shipments, lower freight rates, prompt deliveries. For assistance in ordering, call the Foster Track Specialist near you.

Write **L. B. FOSTER CO.** for Track Catalog IA-7
Pittsburgh 30 • New York 7 • Chicago 4 • Houston 2
Los Angeles 5 • Atlanta 8 • Cleveland 35

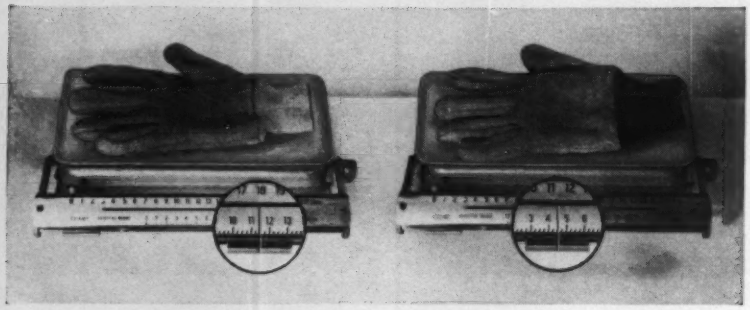
Faster From Foster

Pipe · Piling · Rail



Here is an untreated terry cloth glove being soaked in oil.

Here is an oil-repellent Oilmac glove getting the same treatment.



Now we weigh the untreated glove. It is oil soaked and soggy, weighs a full 11½ ounces. Not very comfortable to wear!

But the Oilmac has only surface oil, weighs a mere 4½ ounces. Both gloves weighed 2½ ounces before being immersed.

Proof: Untreated gloves soak up oil...new Oilmacs stay light, comfortable!

Now you've seen it! Specially treated Oilmacs really repel oil . . . stay light, comfortable, flexible even after *soaking* in oil. Mind you, there's nothing wrong with the untreated gloves: we sell carloads of them, and they are fine for most applications. But where oil is a problem, Oilmacs are the answer! Moreover, new Oilmacs are far more cut resistant than expensive leather gloves . . . can be reconditioned with virtually no loss in oil resistance . . . and are interchangeable, so any two make a pair, any pair gives you four working surfaces. Write today for literature about these new work gloves by Jomac!

Jomac also makes a complete line of North PVC Coated Gloves and Wet Weather Garments

JOMAC

Jomac Inc., Dept. K
Philadelphia 38, Pa.

"Jomac Sells Quality...and Quality Sells Jomac!"

MEETINGS

(Continued from P. 15)

Association headquarters, 1721 De-Sales St., N. W., Washington, D. C.

American Die Casting Institute — Annual meeting, Sept. 14-16, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.

National Foundry Assn.— Annual meeting, Sept. 22-23, Edgewater Beach Hotel, Chicago. Association headquarters, 53 W. Jackson Blvd., Chicago.

Porcelain Enamel Institute, Inc.— Annual meeting, Sept. 25-28, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1145 19th St., N. W., Washington, D. C.

Farm Equipment Institute—Annual convention, Sept. 25-28, The Statler Hilton Hotel, Dallas, Tex. Institute headquarters, 608 S. Dearborn St., Chicago.

American Welding Society — Fall meeting, Sept. 26-30, Pittsburgh. Society headquarters, 33 West 39th St., New York.

OCTOBER

Metal Lath Mfrs. Assn.—Fall meeting, Oct. 6-7, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, Engineers Bldg., Cleveland.

The Electrochemical Society, Inc. —Fall national meeting, Oct. 9-13, Shamrock Hotel, Houston, Tex. Society headquarters, 1860 Broadway, New York.

American Gas Assn.—Annual convention, Oct. 10-12, Atlantic City. Association headquarters, 420 Lexington Ave., New York.

Pressed Metal Institute — Annual meeting, Oct. 10-14, Shawnee Inn, Shawnee-On-Delaware, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.

Marking Device Assn. — Annual convention, Oct. 12-14, Hotel Roosevelt, New York. Association headquarters, 912 Chicago Ave., Evanston, Ill.

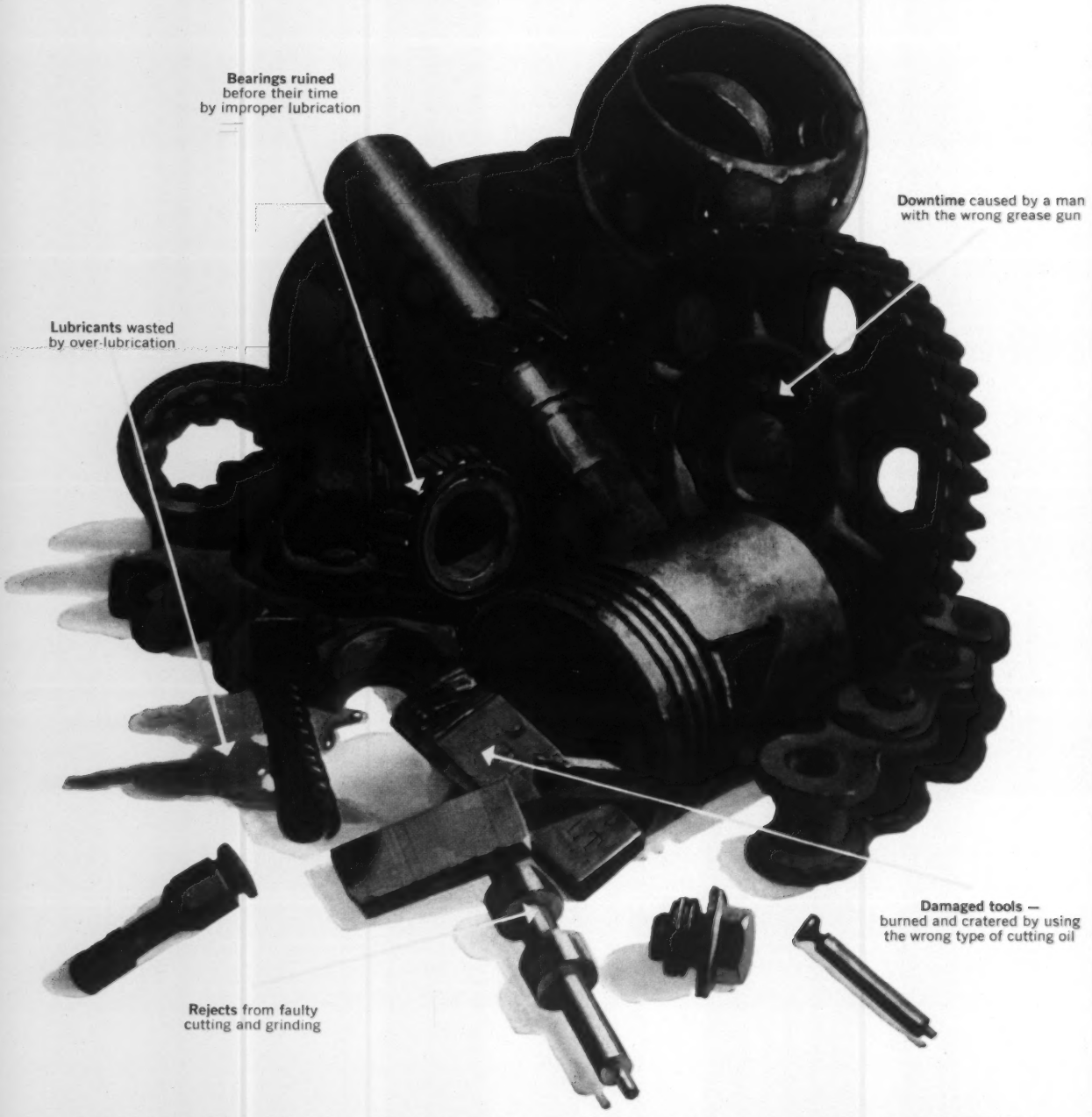
How to starve a scrap pile* at its source

* and all it represents

(DAMAGED TOOLS, RUINED MACHINES, REJECTS, WASTED LUBRICANTS, UNSCHEDULED DOWNTIME . . .)

TEXACO

Start a "STOP LOSS" program


Bearings ruined before their time by improper lubrication
Downtime caused by a man with the wrong grease gun
Lubricants wasted by over-lubrication
Damaged tools — burned and cratered by using the wrong type of cutting oil
Rejects from faulty cutting and grinding

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

Texaco's "Stop Loss" program has been developed for progressive managers in production, maintenance, purchasing, engineering and accounting who wish to apply new methods to control costs and add to profits.

The program has two purposes: (1) to demonstrate how organization of lubrication practices can be used to control costs resulting from product rejects, downtime, machine repair, excessive inventory, and (2) to provide specific instruction material to help plant groups find out where and how they can use Organized Lubrication to control costs in their own operations.

Lubrication is common to almost all plant functions. So don't be surprised when the "Stop Loss" program reveals ways to save in many places!

TURN PAGE FOR WHY

Expect tangible results!

HERE'S WHY AND WHERE:

In 1959, hundreds of plants organized their lubrication practices to reduce costs.

Their managements had recognized this fact: *Lubrication is no longer just a routine operating procedure. It is a key factor in controlling costs and, as such, rightly becomes a management function.*

This doesn't mean that management must put on overalls and grab a grease gun. But when management recognizes the dollars-and-cents significance of Organized Lubrication, they have made the first step toward reduced costs throughout the plant.

The Texaco Organized Lubrication Plan studies your lubrication methods in terms of long-range savings in production, equipment life, manhour utilization and inventory. A re-evaluation in terms of Organized Lubrication usually reveals how immediate savings can be made and continued.

Texaco has developed techniques and experience to make this new concept operative. They are offered to you, with the understanding that any Organized Lubrication program depends for success on those who adopt it and apply it.

Here's the help you need to starve YOUR scrap pile

Here are the parts of the Texaco Organized Lubrication Plan available to interested plant groups:

1. "Stop Loss with Organized Lubrication," a new 25-minute color and sound film created to show the opportunities for cost control through "Organized Lubrication."

2. A film "package" for plant departments. This consists of movies on cutting oils, greases, hydraulic oils, etc., that may be selected for showing after seeing the "Stop Loss" film.

3. Coordinated booklets on the film subjects and others to be used as guides in specific areas.

4. A Texaco Lubrication Control System to take the guesswork out of your lubrication scheduling. This simple system costs almost nothing to install, yet can save up to 15 per cent of your maintenance costs.

We can promise you that a modern Texaco Organized Lubrication Program will produce a package of economies in your plant. Texaco Inc., 135 E. 42nd St., N. Y. 17, N. Y.

FROM

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FIRM & ADDRESS _____

CITY _____ ZONE _____ STATE _____

FIRST CLASS
Permit No. 6990
New York, N. Y.

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

POSTAGE WILL BE PAID BY

TEXACO INC.

135 East 42nd Street

New York 17, N. Y.

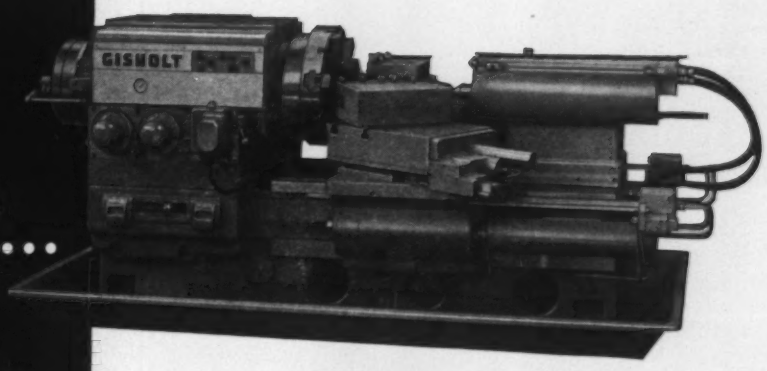
DEPT. IA-150

This is your ticket to see Texaco's vital new movie "STOP LOSS"

Sign and mail it today!

TEXACO
REG. T.M.

fast... fast... fast... and versatile...

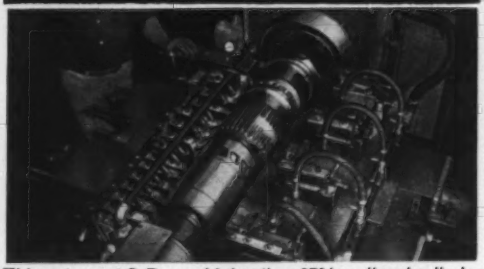


that's why the

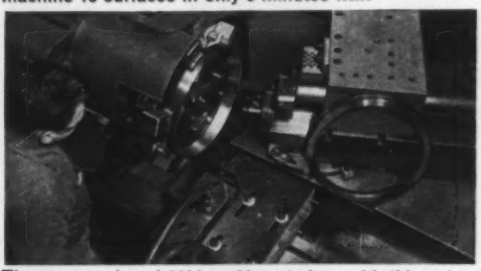
GISHOLT No. 24

Automatic Chucker

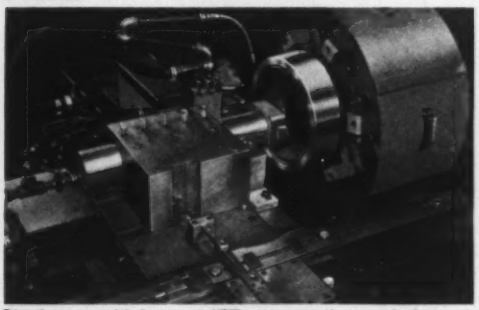
cuts costs four ways



This setup cut O.D. machining time 27% on diesel cylinder liners. Basic design of No. 24 offers flexibility and power to handle multiple surfaces on large parts. Nineteen tools machine 16 surfaces in only 6 minutes f.t.f.



Time was reduced 30% on 60 part sizes with this setup. Front and rear independent slides are placed to suit the work. Optional swivel bases speed angular settings. F.t.f. time on the 15¾" steel outer bearing race shown, only 3 minutes.



Single- or multiple-pass JETracers on the rear independent slide increase versatility. Here a single-pass JETracer handles six types and 24 sizes of steel bearing races. Two 8-minute operations complete part shown, removing 90-lb. metal, holding .0005" tolerance in spherical bore.

When you bring the speed and the versatility of the Gisholt MASTERLINE No. 24 into your shop, here's what happens:

1. You profit from high-speed, automatic production on a wide range of work, from small lots to long runs.
2. You get the production of an expert from an inexperienced operator. Automatic cycle gives you repeat accuracy and optimum tool life at fixed production rates.
3. You reduce labor requirements—one operator handles two or more machines.
4. You get the speed, the power, the rigidity to take full advantage of today's most advanced cutting tools for maximum metal removal and finer finishes.

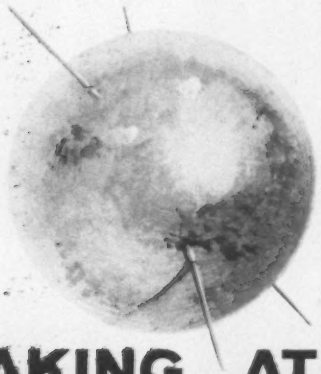
The jobs at the left are just a small sample of what you can do on the fast, versatile Gisholt MASTERLINE No. 24 Automatic Chucking Lathe. What can it do...how much can it save on your work? Find out. Call your Gisholt Representative or write for Bulletin 1213.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

Investigate Gisholt's Extended Payment and Leasing Plans

MMT=PE

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Lathes
• Factory-Rebuilt Machines with New-Machine Guarantee



STEELMAKING AT JESSOP

. . . A Proud Inheritance That Benefits You

It takes a lot of know-how and attention to infinite detail to launch a U. S. space satellite. Everything's got to be as near perfect as humanly possible. That's why the scientists and engineers who design our missiles look to Jessop for quality steels.

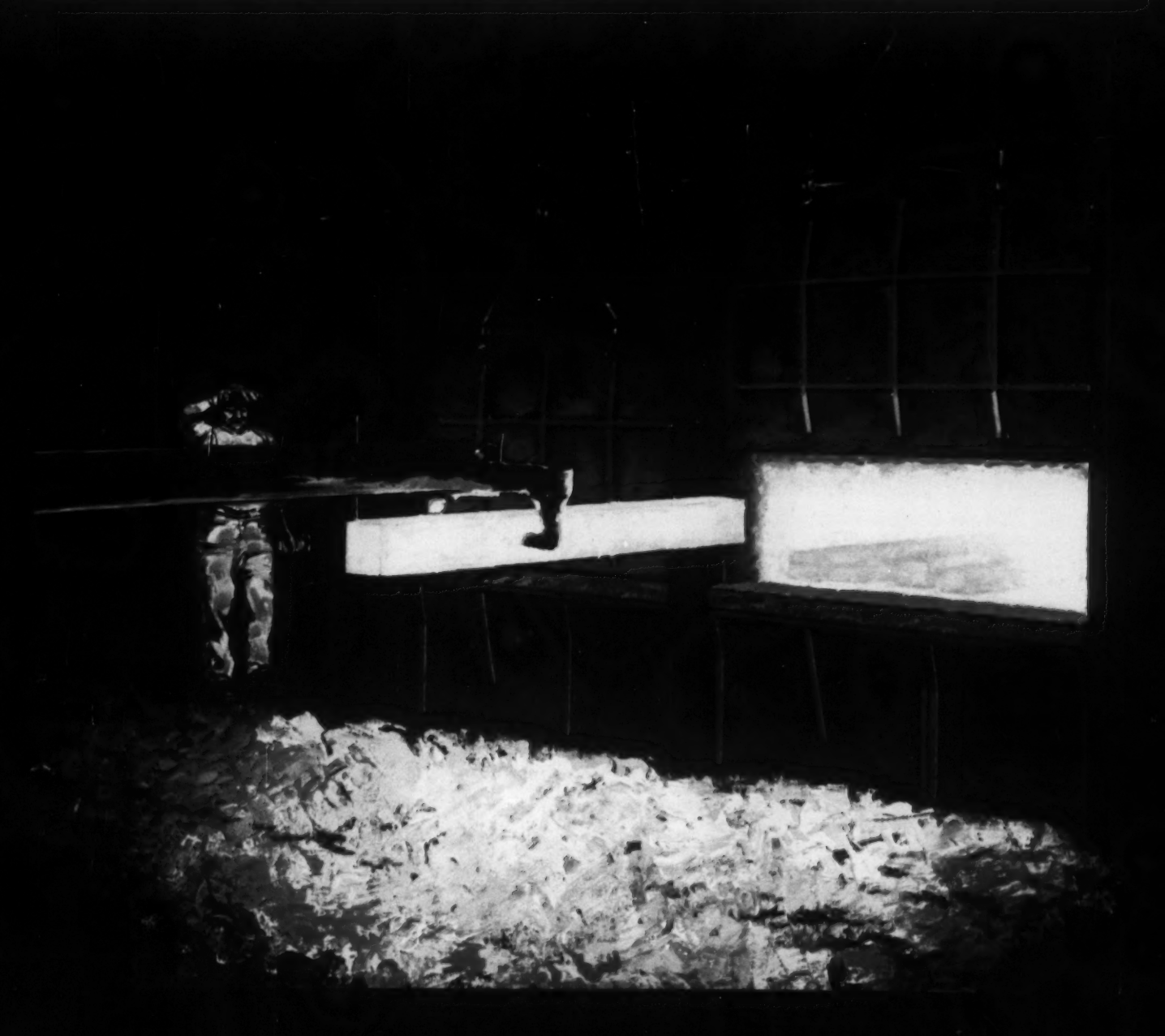
Jessop makes heat, corrosion, abrasion and shock resistant steels, non-magnetic and precision ground steels, high speed, cast-to-shape, clad, stainless and alloy steels and many others. And behind every pound of steel you order from Jessop is a well-deserved reputation for excellence of product.

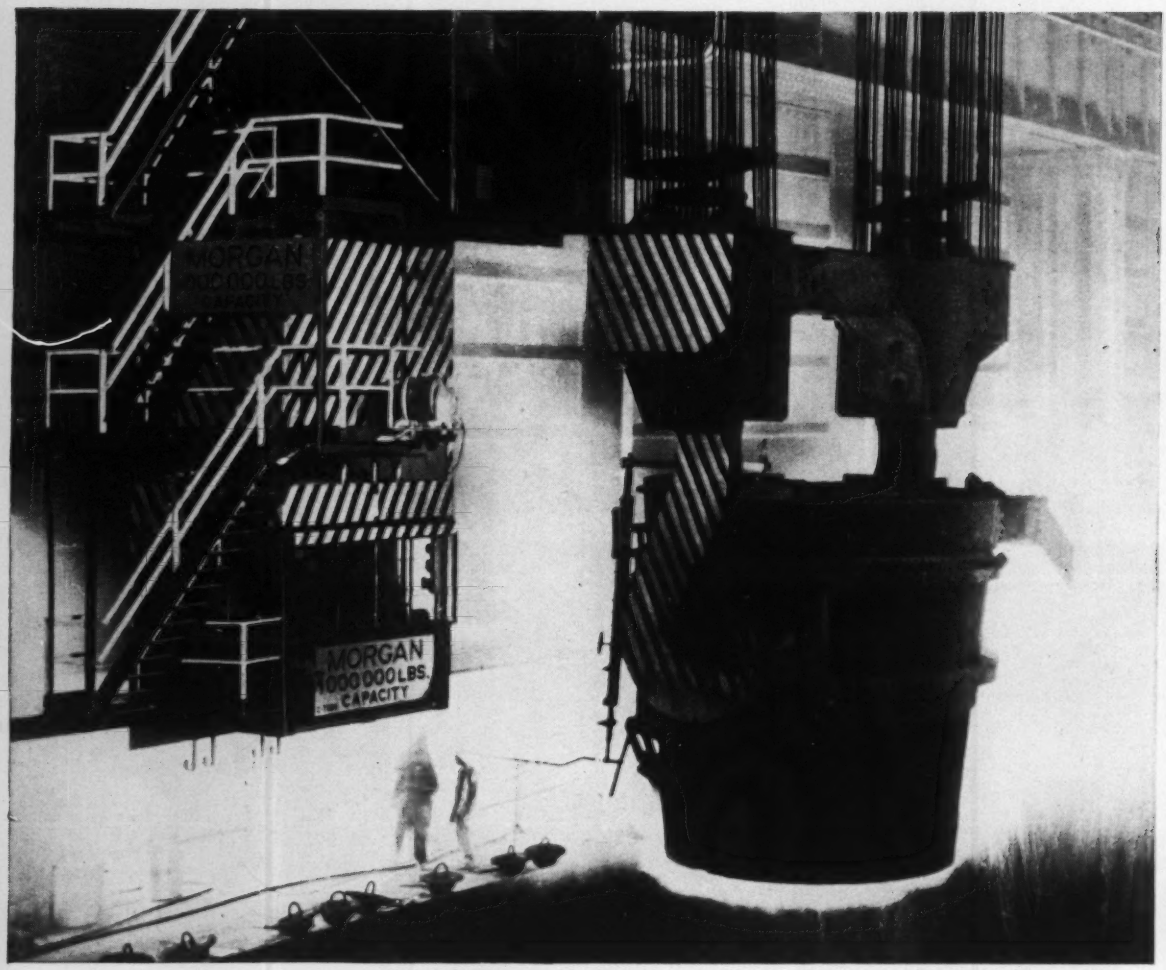
The name Jessop has been synonymous with quality steels since 1774. Today, backed up by generations of experience, Steelmaking at Jessop is a proud inheritance—an important plus factor you should consider when buying steel.

Jessop now has six plants and service center locations in the United States and Canada with general sales offices in 23 major cities of North America. Why don't you pick up your telephone, call a Jessop office and discuss *your* needs for specialty and alloy steels.

JESSOP
STEEL COMPANY

GENERAL OFFICES: Washington, Pa. **PLANTS AND SERVICE CENTERS:** Washington, Pa. · Los Angeles · Chicago · Detroit · Owensboro, Ky. · Wallaceburg, Ont.





Repeated million-pound loads in the intense heat from 375 tons of molten steel, cause no spalling or deformation of Rollway Bearings.

1,122,000 Pounds Ride on 68 Rollway Bearings

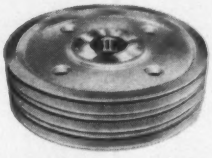
One of the largest in the world, this 500-ton Morgan-built ladle crane is Rollway equipped in many positions.

Sixty-eight maximum-type, solid-cylindrical bearings—mounted without inner races—lift and lower the 1,122,000-pound weight of the lifting beam, ladle hooks, ladle and white-hot steel.

Rollway Tru-Rol® type bearings are used in the two General Electric 360 HP – MD-620 Hoist motors which lift the weight of the ladle and its molten metal content.

The maximum-type bearings in the hoisting sheaves are mounted directly on the shaft without inner races, which greatly simplifies assembly for applications of this size.

Thrust bearings in the 25-ton and 75-ton auxiliary crane hooks are standard Rollway precision types with broad-area contact between rollers and plates to prevent Brinelling and assure freedom of rotation under the heaviest loads.



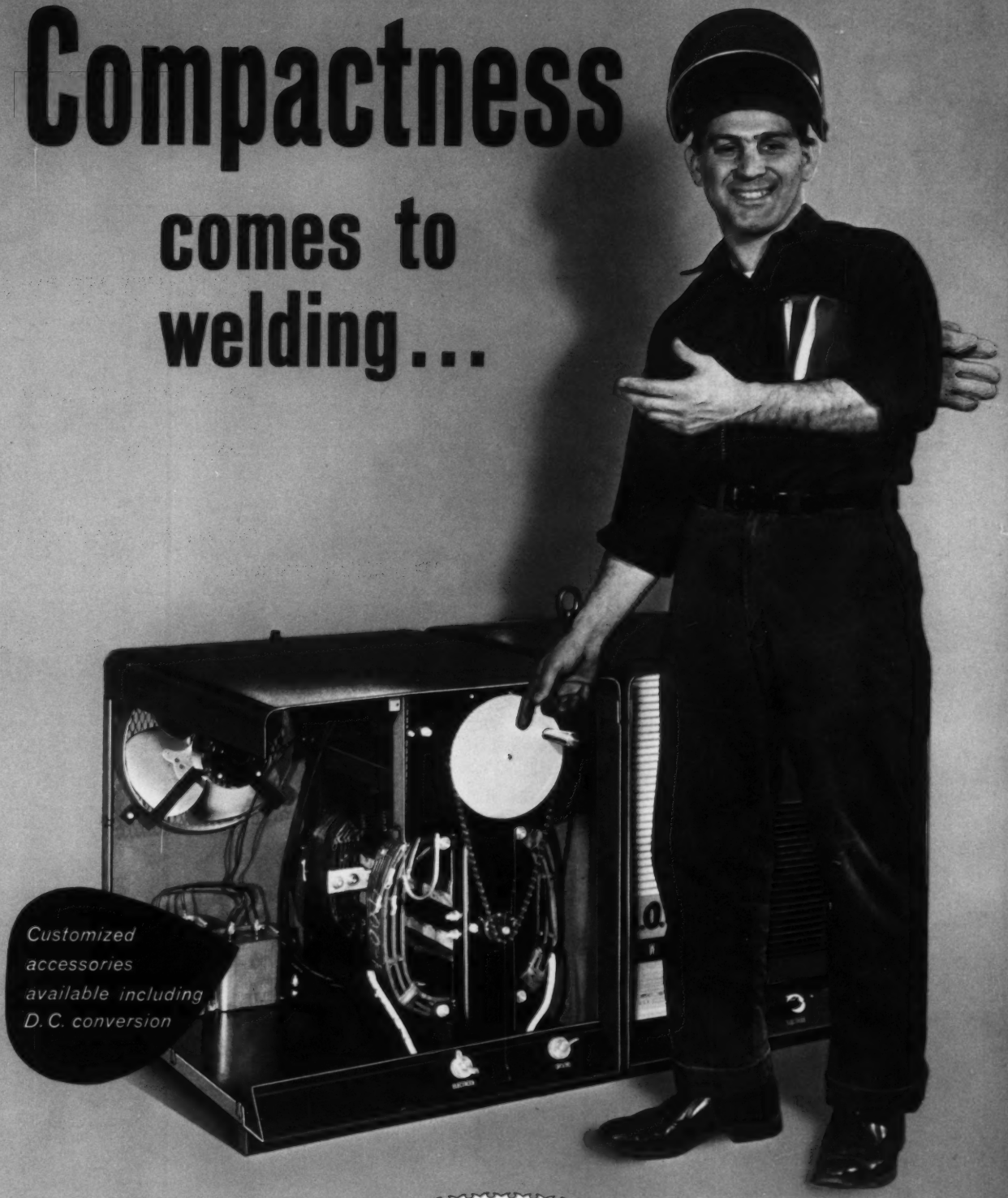
Sheaves ready for assembly on shaft and installation in lifting beam.

For bearings that accomplish the extraordinary in an ordinary manner, write, wire or 'phone Rollway Bearing Co., Syracuse 1, N.Y.

ROLLWAY® BEARINGS

ENGINEERING OFFICES: Syracuse • Boston • Chicago • Detroit • Toronto • Pittsburgh • Cleveland • Seattle • Houston • Philadelphia • Los Angeles • San Francisco

Compactness comes to welding...



Customized accessories available including D.C. conversion

A. O. Smith's new MONARC line trims the waste from welding machines

No waste of space!

No waste of space!

It stacks! It racks! It slides under a bench with the greatest of ease. Only 28 inches low . . . 24 inches wide . . . 30 inches deep—the **MonArc** fits where others take up valuable floor space. You release area for increased production — an important factor with industrial space cost averaging $10 a square foot. We achieved this compact design without compromising superior welding characteristics of the moving-coil machine by making coil movement lateral.

No waste of motion!

We made time and motion studies. We learned how to achieve compactness with no sacrifice in operational ease. For example, while the **MonArc** is a *foot lower* than conventional machines, the full-range, stepless current-control wheel is at convenient arm's length—higher than competitive models. We also cut down handwheel turns to 15 — fewer turns and easier turning than with any other standard characteristic welder in the market.

No waste of money!

Superior in design. At an economical price, no other machine gives you so much for your money. But while you get more, you never get more than you want. The **MonArc** line consists of three basic machines (300, 400, 500 amp models). We customize this basic line with a selection of tailored accessories. You check off exactly what you need — no built-in "excessories" that add only cost to your operation.

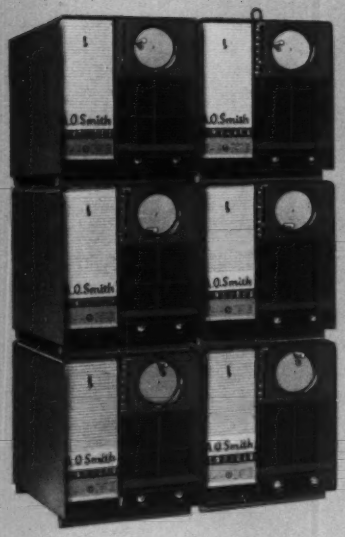
No waste of time!

Our customized approach also saves on delivery time. You don't have to wait two or three weeks for delivery of a certain model from our home factory. Basic machines and customized accessories are stocked in warehouse centers and distributor houses enabling us to meet your requirements exactly . . . and meet them quickly.

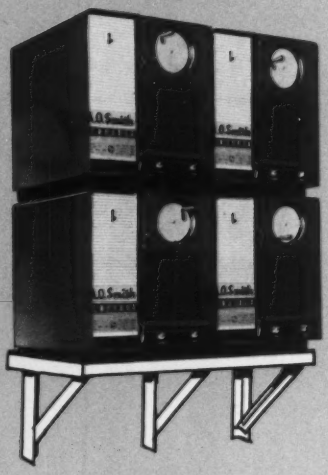
Compactness comes to welding...

A. O. Smith's new MONARC line compacks more machine in a smaller package at a smaller price

400 AMP model shown — all models same size.

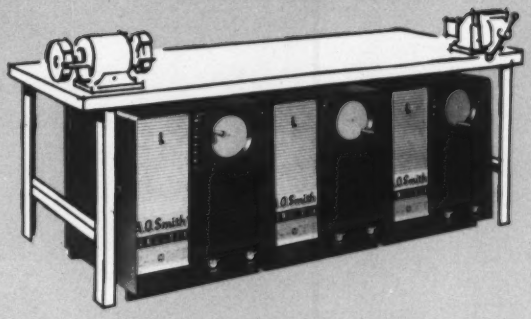


It stacks up to three high!



It racks!

It slides under a bench!



SEE HOW IT STACKS UP! The new **MonArc** line is on display at A. O. Smith welding equipment distributors everywhere.

SPECIFICATIONS

Series No.	Rated amperes at 40 volts	Input kw	Duty cycle	Primary amperes with PF correction		Primary amperes without PF correction		Power Factor*		Open-circuit volts	Welding range	Weight in pounds	Height	Width	Length
				230 volts	460 volts	230 volts	460 volts	without capacitor	with capacitor						
300 L	300	12	60%	100	50	108	54	65.4%	79%	80	60-430	363	28"	24"	30"
400 L	400	16	60%	124	62	140	70	65%	84.5%	80	75-550	400	28"	24"	30"
500 L	500	20	60%	158	79	174	87	66.7%	84.2%	80	90-670	415	28"	24"	30"

*Power factor is the average value which includes the benefits of the power factor capacitors when not welding (based on 60% duty cycle).

Because welding fabrication is our full-time business, A. O. Smith maintains the industry's most comprehensive research and development facilities. That's why we can offer you America's finest machines, accessories and electrodes. And when you call your man from A. O. Smith, you'll find that he's more than just a salesman. He's a welding specialist fully qualified to help with your welding problems.

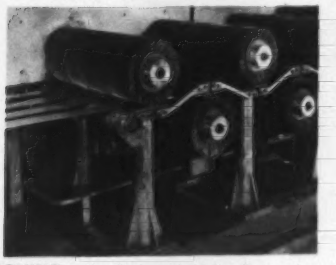
Through research ... a better way

A.O.Smith
CORPORATION
WELDING PRODUCTS DIVISION
Milwaukee 1, Wisconsin
A. O. Smith INTERNATIONAL S.A., Milwaukee 1, Wis., U.S.A.

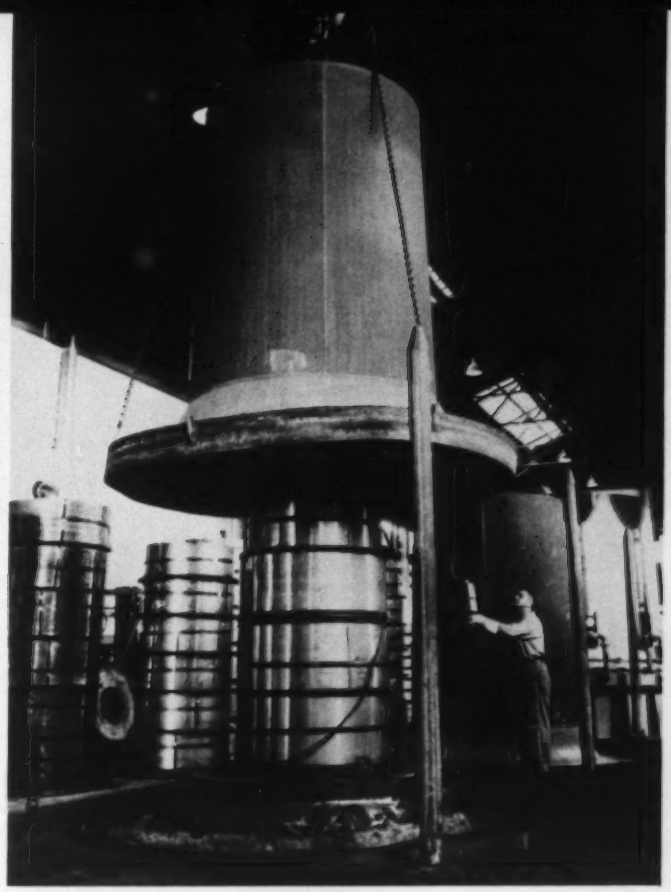
MW-263

LITHO IN U.S.A.

PRECISION ROLLING of high-carbon flat wire is accomplished on Athenia Steel's 3-stand tandem mill with automatic screwdown control.

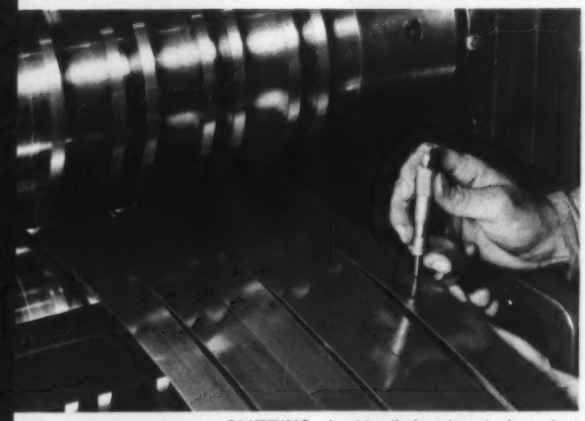


POLISHING and coloring gives the flat spring steel its final processing and desired finish: polished, blued, strawed or scaleless.



ANNEALING of Athenia Steel is achieved in these advanced, radiant type convector furnaces.

When you need quality spring steel ...check NS-Athenia



SLITTING of cold-rolled spring steel requires careful quality control and precise manufacturing techniques.

The Athenia Steel Division of National-Standard Company can fill your high-quality, cold-rolled spring steel needs for hundreds of industrial applications. The high-quality of Athenia Steel is due to proper raw material selection, precise laboratory control and modern equipment and technical knowledge. Check these fine spring steels available from National-Standard:

COLD-ROLLED ANNEALED—thicknesses of .001″ to .065″; widths of .015″ to 16″.

TEMPERED SPRING STEEL—thicknesses of .001″ to .065″; widths of .015″ to 6.5″ in black or scaleless, Polished Bright, Polished and Blued, or Strawed.

COLD-ROLLED STAINLESS—thicknesses up to .040″; widths up to .500″.

NILCOR® (cobalt base)—thicknesses up to .025″; widths to 1″.

TECHNICAL HELP from Athenia engineers is available to determine the specific flatness, straightness, uniformity, temper, edge, finish or special feature you need. Write to Athenia Steel Division, National-Standard Company for engineering assistance, or ask for new brochure describing Athenia products, service and manufacturing facilities.

NS NATIONAL-STANDARD COMPANY

Athenia Steel Division

NATIONAL-STANDARD COMPANY

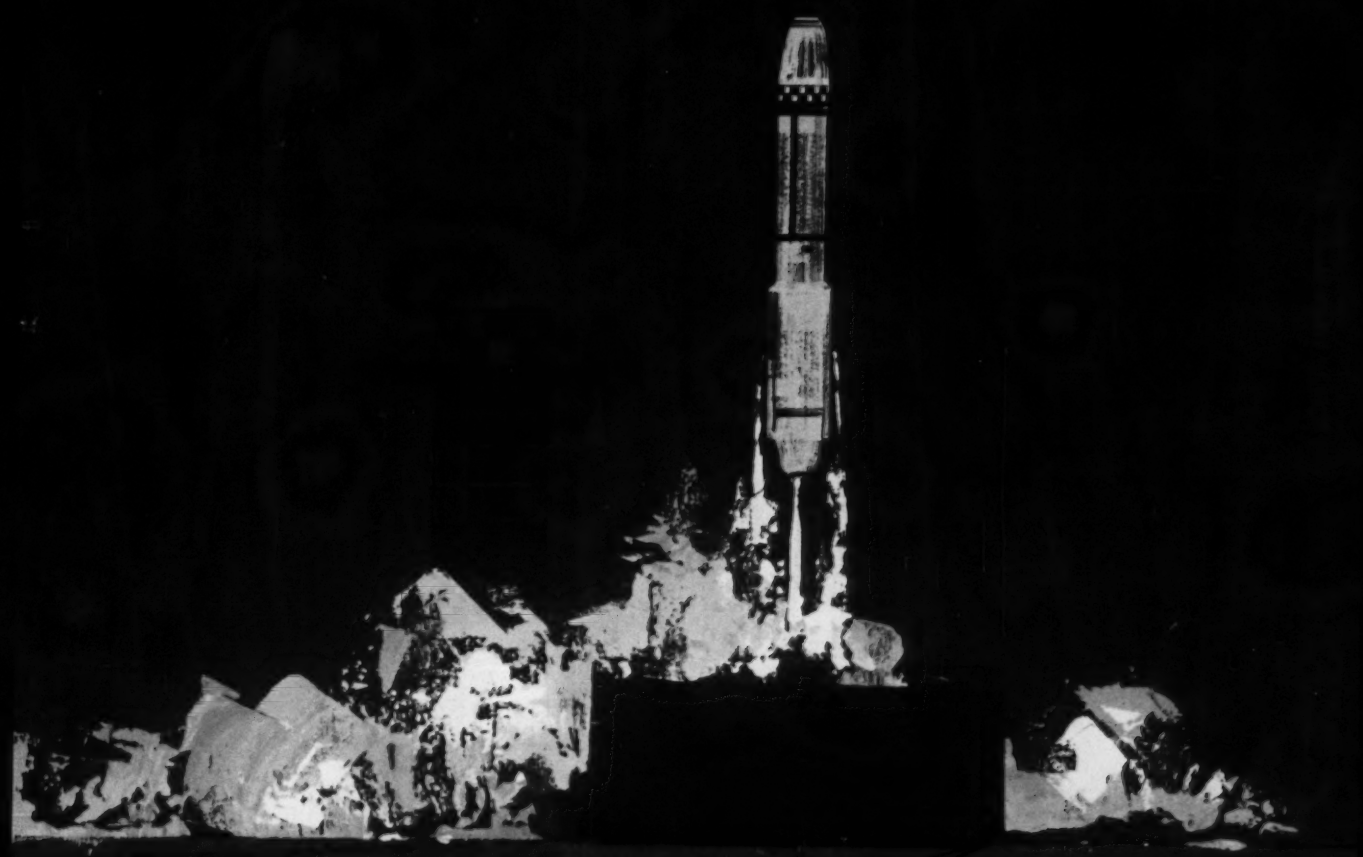
Clifton, New Jersey

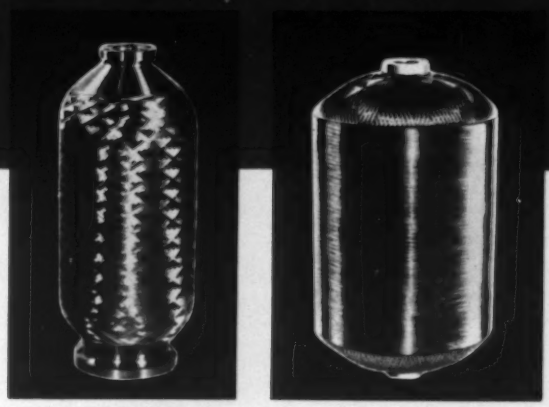
NS SPECIAL WIRE (575,000 psi) WRAPS

In the development of solid-fuel rocket cases, a leading manufacturer fabricated and experimented with welded steel and glass fibers, as well as many steel wire specimens, to find a fuel case material with the most favorable strength-to-weight ratio for fuel case applications.

EARLY DEVELOPMENT STAGES—At the outset of their testing program, the rocket manufacturer asked National-Standard to develop .004″ wire with 575,000 psi, the ultimate tensile strength required of steel wire to provide the strength-to-weight ratio needed. The wire was to be made into tapes of uniformly-stressed wires, coated with epoxy resin to separate the wires, and wound over collapsible mandrels to form the fuel case.

NATIONAL-STANDARD ENGINEERS produced .004″ high-carbon steel wire that met every specification, after intensive testing with many types of wire and finishes. Special wire developed by NS met rigid size tolerances, residual twist and controlled cast requirements.





WIRE-WRAPPED ROCKET CASES are wound over collapsible mandrels using a number of strands of very high strength, small diameter wire formed into tapes.

ROCKET FUEL CASES

The end result of NS—customer cooperation was the ability to produce wire-wrapped rocket cases with very high hoop stress and lower cost than those being produced by other methods. And the fuel case manufacturer is able to provide maximum case-to-case reliability.

EXPERIENCED ENGINEERING HELP of this kind is available to you from National-Standard to meet special or unique high-quality wire applications. Write for additional information to National-Standard Company, Niles, Michigan.

NS NATIONAL-STANDARD COMPANY

Manufacturer of Specialty Wire and Metal Products

NATIONAL-STANDARD COMPANY

Niles, Michigan

NATIONAL-STANDARD PLANTS ARE SERVICE-LOCATED NEAR YOU...

National-Standard Company is a specialized manufacturer of high-quality wire, wire cloth, flat spring steel, perforated metal, and other products. With manufacturing and warehousing facilities around the world, National-Standard is ideally organized to serve your special wire or metal product requirements. For fast delivery or engineering services, contact the National-Standard plant or warehouse nearest you.

NATIONAL-STANDARD DIVISION

Music spring wire, stainless steel wire, super-alloy wire, plated wire, tire bead wire, flat and tubular braid.

Niles, Michigan
Akron, Ohio
Los Angeles, California
Kansas City, Missouri

ATHENIA STEEL DIVISION

Cold rolled high-carbon flat spring steel, tempered or annealed; alloy steel, high-carbon and stainless steel, flat wire.

Clifton, New Jersey

REYNOLDS DIVISION,

Wire Cloth Plant

Full range of weaves, metals, and coatings; specialty weaves.

Dixon, Illinois

Cross Perforated Metals Plant

Commercial, ornamental and industrial perforated metals.

Carbondale, Pennsylvania

WORCESTER WIRE DIVISION

Fine high and low carbon wire, music spring wire, stainless steel wire, plated wire, other specialty wires.

Worcester, Mass.

WAGNER LITHO MACHINERY DIVISION

Metal decorating equipment

Secaucus, New Jersey

NATIONAL-STANDARD *plants and facilities are also located in Guelph, Ontario; Kidderminster, England; Port Elizabeth, South Africa; Cologne, West Germany; and Mexico City, Mexico.*

WAREHOUSES

NATIONAL-STANDARD WAREHOUSE, ***Plainville, Conn.***
Music spring wire and stainless steel wire, high-carbon cold-rolled annealed strip and spring steels.

NATIONAL-STANDARD WAREHOUSE, ***Akron, Ohio***
Music spring wire and stainless steel wire.

WAREHOUSE DISTRIBUTORS

CENTRAL STEEL & WIRE COMPANY, ***Chicago, Illinois***
Music spring wire.

KRUSEN WIRE & STEEL COMPANY, ***Los Angeles, California***
Music spring wire and stainless steel wire, high-carbon cold-rolled annealed strip and tempered spring steels.

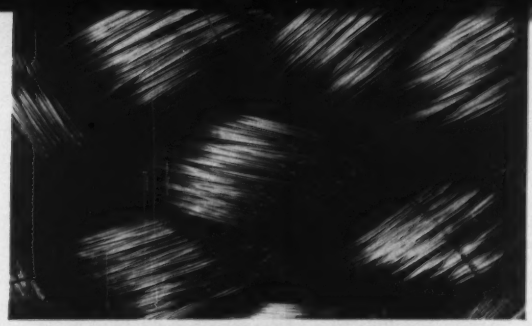
LAPHAM-HICKEY STEEL CORPORATION, ***Chicago, Illinois***
High-carbon cold-rolled annealed strip and tempered spring steels.

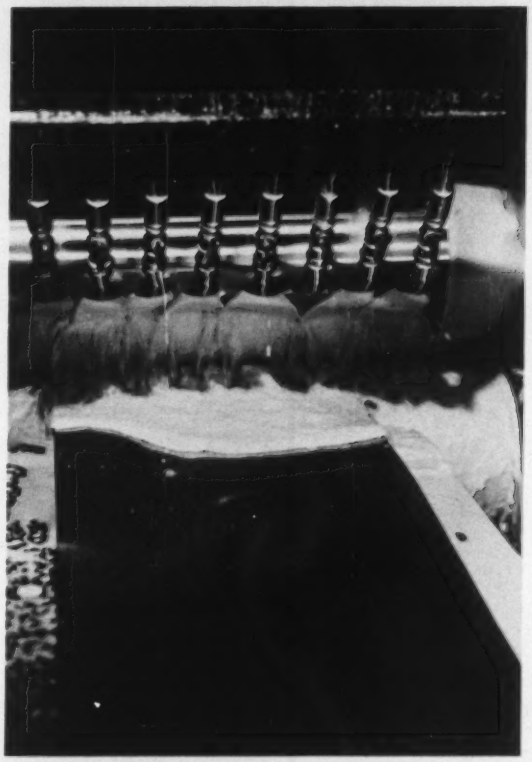
VOSS-DAVIDSON STEEL COMPANY, ***Detroit, Michigan***
High-carbon cold-rolled annealed strip and spring steels.

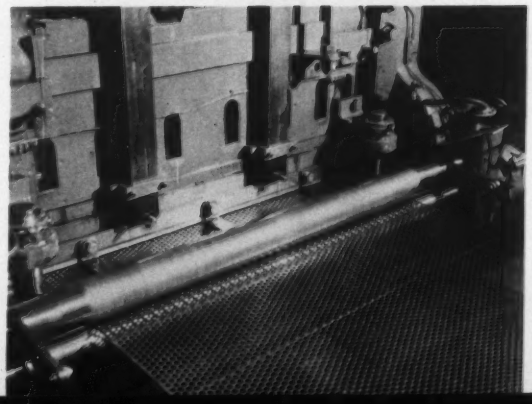
DISTRIBUTORS of CROSS *Perforated Metals are located in major industrial areas. See your local classified telephone directory.*

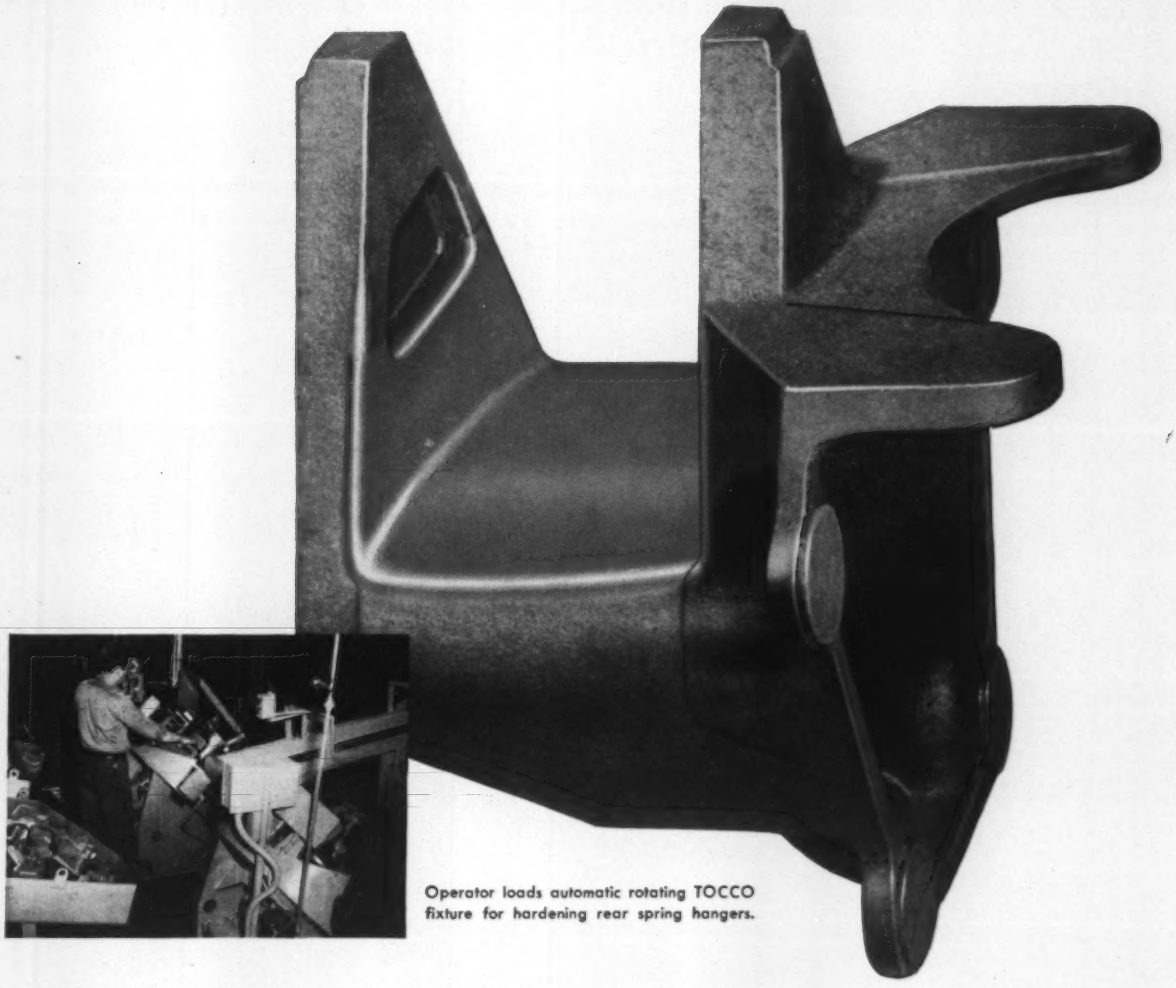
NS NATIONAL-STANDARD COMPANY

NATIONAL-STANDARD COMPANY
Niles, Michigan









Operator loads automatic rotating TOCCO fixture for hardening rear spring hangers.

The job they said "couldn't be done"

now being hardened—1 every minute

with TOCCO* Induction Heating

This unusually shaped part is a rear spring hanger used in the spring suspension system of a major truck manufacturer. The hardness pattern covers the "flat" section, which actually isn't flat but blends two widely varying radii, and the sides or "ears" a portion of which must be hardened to the same depth—.060″ to .090″. Nine of these irregularly shaped castings are loaded in a rotating fixture and scanned progressively by a TOCCO inductor block at the rate of one per minute. An air gap of .060″ is maintained between the inductor and the part—quite a tricky achievement since the spring hangers are unmachined castings with normal foundry tolerances of ±.045″.

This job is typical of many where TOCCO engineers have worked out a satisfactory and reliable production setup for a supposedly impossible heating job. If you have a difficult heating job—hardening, brazing, soldering or heating for forming or forging it will pay you to consult TOCCO—without obligation, of course.

TOCCO

JUST PUSH A BUTTON

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today— **NEW FREE Bulletin**

The Ohio Crankshaft Co. • Dept. A-7, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating"

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

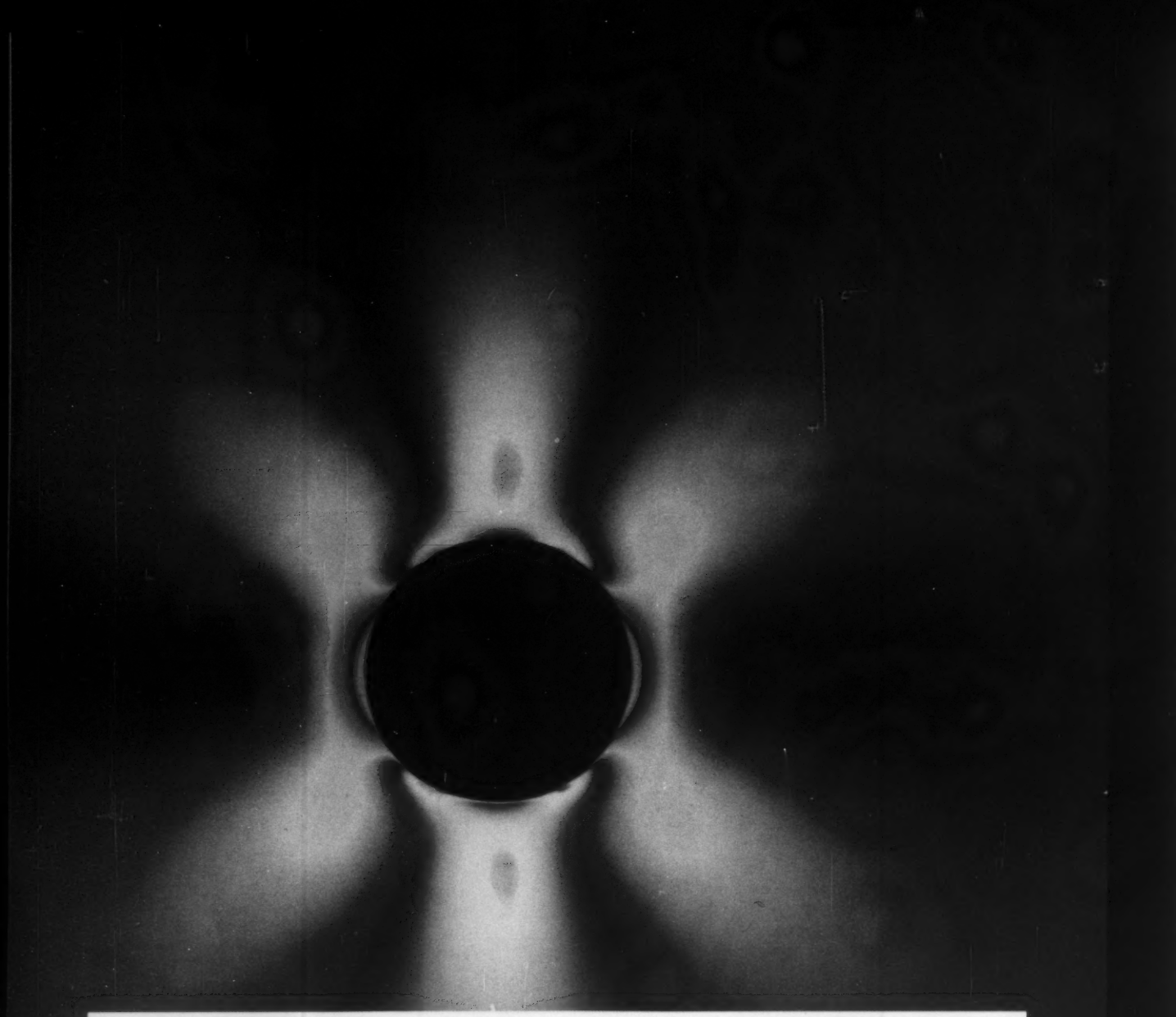


Photo-elastic stress patterns produced by models photographed with polarized light are one of the modern analytic tools available for ever-increasing perfection of Malleable iron castings.

For Greatest Strength Per Dollar... Use Malleable

To improve quality and cut costs, you'll find nothing better than Malleable iron castings. They provide more strength per dollar than any other metal, ferrous or non-ferrous! With Malleable you also get proven toughness, uniform quality and unsurpassed machinability.

See for yourself how much Malleable castings will improve your products and cut your costs. Send drawings or an outline of your requirements to a nearby Malleable castings producer who displays this symbol—

MEMBER
MALLEABLE
CASTINGS COUNCIL

For detailed information on "Strength Characteristics of Malleable Iron Castings", contact any of the progressive companies listed on the opposite page, or Malleable Castings Council, Union Commerce Building; Cleveland 14, Ohio.

"Value Analysis" Proves–

Malleable Castings Improve Quality, Reduce Costs

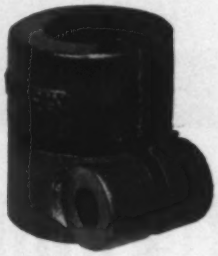
When "Value Analysis" is your task, consider these outstanding advantages of Malleable iron castings: more strength per dollar than any other metal, ferrous or non-ferrous; exceptional machinability; metal exactly and only where it is needed; job-proven toughness.

Switch to Malleable Saves 47% on Railroad Car Thrust Collar

One of countless examples of cost reduction obtained by changing from other materials or processes to Malleable castings is this thrust collar used on railroad maintenance cars. While the steel part formerly used performed satisfactorily, it cost 99¢ before machining.

The cost of the standard Malleable casting before machining is only 51.7¢ — a saving of 47.3¢! Added to this, four machining operations — drilling of bolt hole, spot facing for bolt head and nut, milling the sleeve slot and sawing the transverse slot — were eliminated by switching to a casting. All remaining machining operations are improved due to Malleable's exceptional machinability.

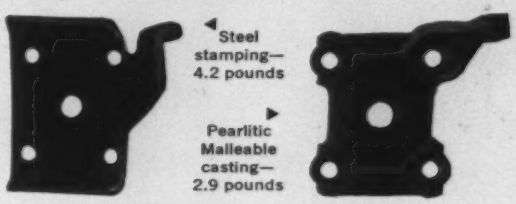
Former part before machining (99¢)



Malleable casting before machining (51.7¢)

Cost Cut 15% on Spring Bracket by Using Malleable Producer's Engineering Services

This automotive rear spring bracket was originally a steel stamping, S. A. E. 1015, .438 stock, designed to withstand 800 pounds maximum push or pull load on the shock absorber ear. Casting design experience coupled with use of stress analysis techniques by the foundry's designers reduced weight from 4.2 pounds to 2.9 pounds while increasing the part's yield strength to nearly 3,000 pounds. Result: the pearlitic Malleable bracket performed better . . . cost 15% less!



Cost-Saving Engineering Assistance Available

The kind of engineering assistance that cut costs and improved product quality for these companies and thousands of others is available to you from any of the progressive producers of Malleable castings that are members of the Malleable Castings Council. Start increasing your product profitability right now — contact any of the companies listed below.

Free Information Folder

Your copy of an informative folder, *Data Unit 110—Malleable Castings in the Value Analysis Spotlight*, is available free from the Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio, or from any member company.

For Quality and Economy... Use MALLEABLE

For Service In Your Area Contact...

CONNECTICUT
Connecticut Mall. Castings Co., New Haven 6
Eastern Malleable Iron Co., Naugatuck
New Haven Malleable Iron Co., New Haven 4

DELAWARE
Eastern Malleable Iron Co., Wilmington 99

ILLINOIS
Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co., Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur

INDIANA
Albion Malleable Iron Company, Muncie Division, Muncie
Link-Belt Company, Indianapolis 6
National Mall. & Steel Castings Co., Indianapolis 22

IOWA
Iowa Malleable Iron Co., Fairfield

MASSACHUSETTS
Belcher Malleable Iron Co., Easton

MICHIGAN
Albion Malleable Iron Co., Albion
Auto Specialties Mfg. Co., Saint Joseph
Cadillac Malleable Iron Co., Cadillac
Central Fdry. Div., Gen. Motors, Saginaw

MINNESOTA
Northern Malleable Iron Co., St. Paul 6

MISSISSIPPI
Mississippi Malleable Iron Co., Meridian

NEW HAMPSHIRE
Laconia Malleable Iron Co., Laconia

NEW YORK
Acme Steel & Mall. Iron Works, Buffalo 7
Frazer & Jones Company Division Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland

OHIO
American Malleable Castings Co., Marion
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
Dayton Mall. Iron Co., Ohio Mall. Div., Columbus 16
Maumee Malleable Castings Co., Toledo 5
National Mall. and Steel Castings Co., Cleveland 6

PENNSYLVANIA
Buck Iron Company, Inc., Philadelphia 22
Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster

TEXAS
Texas Foundries, Inc., Lufkin

WEST VIRGINIA
West Virginia Mall. Iron Co., Point Pleasant

WISCONSIN
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company, Inc., West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 45

INCREASE WORKER PRODUCTIVITY

MARK SERIES NUMERICAL CONTROLS...

.....standard, job-proved packages now in use on a wide variety of machines

General Electric's Mark series of standard, pre-engineered numerical control packages—with systems for controlling 1 to 5 motions plus machine auxiliary functions — are compiling impressive performance records on scores of machines throughout American industry today.

Machine operation is completely automatic—from punched tape prepared on a standard automatic typewriter. If desired, semi-automatic positioning, useful for prototype work, is obtained with manually set dials on the control station.

Key components of a typical Mark package are a controller, a punched tape reader, operator's control station, servo drives and position-sensing units.

8-TO-1 TIME REDUCTION in press operations is achieved on this 100-ton rotary-turret punch press directed by General Electric numerical control. Rapid positioning of table and turret provides up to 40 punches per minute.

40% AVERAGE TIME REDUCTION for all parts produced on this horizontal boring machine means greater output and better equipment utilization. Lead times are cut by 8-to-1, and non-productive worker time is reduced by more than 60%.

with General Electric numerical control

Boost output of man and machine, reduce in-process inventory

Over the past 7 years, management has seen labor costs increase by 50% with productivity up by only 15%. This profit-cutting gap has accelerated an industry-wide need for production methods such as General Electric numerical control.

Key benefits of G-E numerically controlled machines include increased worker output, increased machine utilization, and reduced in-process inventory in virtually every job.

Manufacturers are now realizing far greater output per man-hour . . . faster "pay-back" rates on machines . . . shorter production cycles . . . and much lower inventory investment—in itself justification for numerical control. Here's an example:

Automatically controlled turret drills are used to produce aircraft-engine accessories at Chandler Evans Corporation, West Hartford, Conn. With numerical control, direct-labor costs have been cut in half! The machine operator — working two machines simultaneously — loads the piece, sets the machine in operation, and all production is performed automatically. But, increased productivity is only part of the story. Scrap losses are virtually eliminated, average lead times are cut by 6-to-1, cutting-tool costs are 1/40th of former production methods, and tool life is increased from 30 to 1300 pieces per tool—all adding up to expected *annual* savings of $42,000, more than enough to pay for both machines within two years.

Join with Chandler Evans and hundreds of other manufacturers who are increasing productivity, gaining better product quality, and eliminating tooling cost with G-E numerically controlled machines. See your G-E Apparatus Sales Engineer or machinery builder today. General Electric Co., Specialty Control Dept., Waynesboro, Va. 795-7

Progress Is Our Most Important Product

GENERAL ELECTRIC

The 180-cycle Multiductor, a low-cost static frequency converter, permits the use of induction on heating and melting applications where costs were previously prohibitive.

THE NAME WITH THE FAMILIAR RING!

The Multiductor, one of several Power Sources... another major product line of AM for the heating or melting of metals by Induction.

"induction heating is our only business"

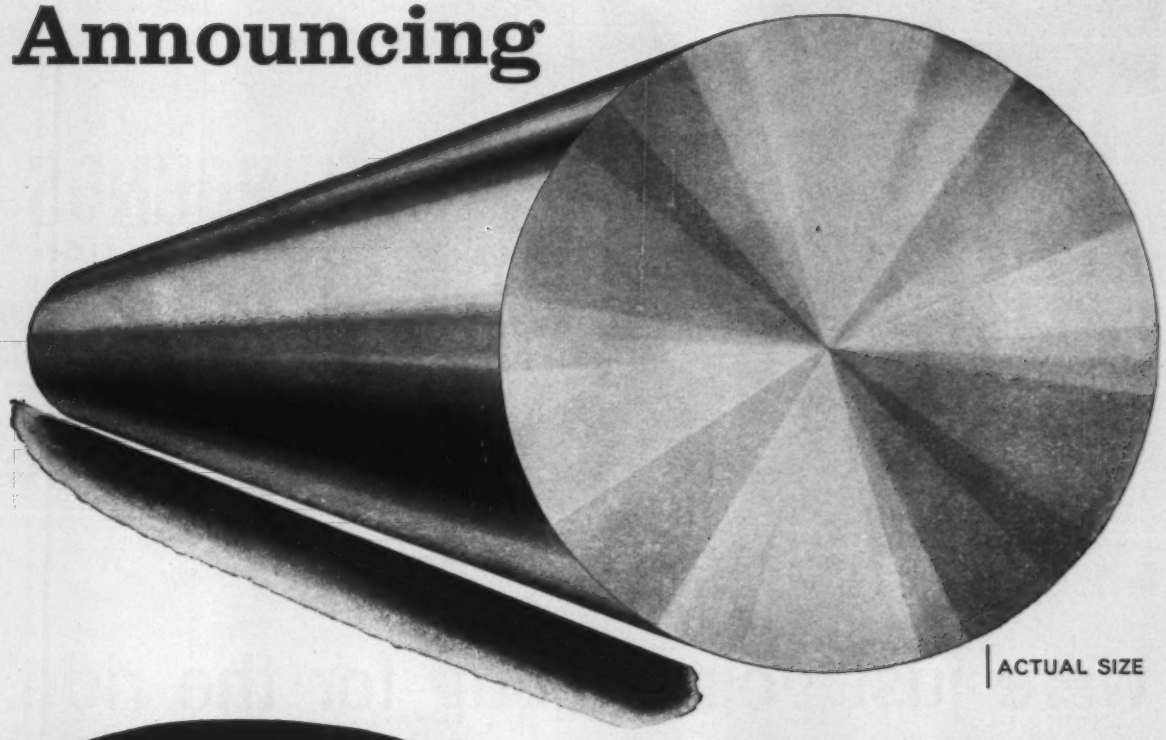
Magnethermic CORPORATION

GENERAL OFFICES
P. O. BOX 839
Youngstown 1, Ohio

TRENTON DIVISION
930 Lower Ferry Road
Trenton 5, New Jersey

YOUNGSTOWN DIVISION
3990 Simon Road
Youngstown 1, Ohio

Announcing



ACTUAL SIZE

STRESSPROOF®
STEEL BARS
WITH COPPER

In Diameters Through 4"

Larger sizes open new application opportunities.
Same high strength as smaller diameters...100,000 psi yield.
Fast machining...83% of B1112.
Cost less than heat treated in-the-bar alloys.
Ideal for both production *and* maintenance applications.

No heat treating necessary

Available from your
Steel Service Center

Ask for Helpful Data Bulletin #15.
It tells the story of STRESSPROOF.

La Salle STEEL CO.

1436 150th Street
Hammond, Indiana

Name_____

Title_____

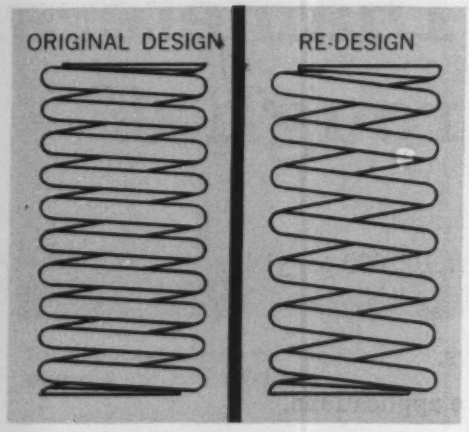
Company_____

Address_____

City_____ Zone____ State_____

70 POUNDS OF SPRINGS

were just going along for the ride!



10 coils—.120″ wire
130 lbs. of wire per
1M springs

7 coils—.105″ wire
60 lbs. of wire per
1M springs

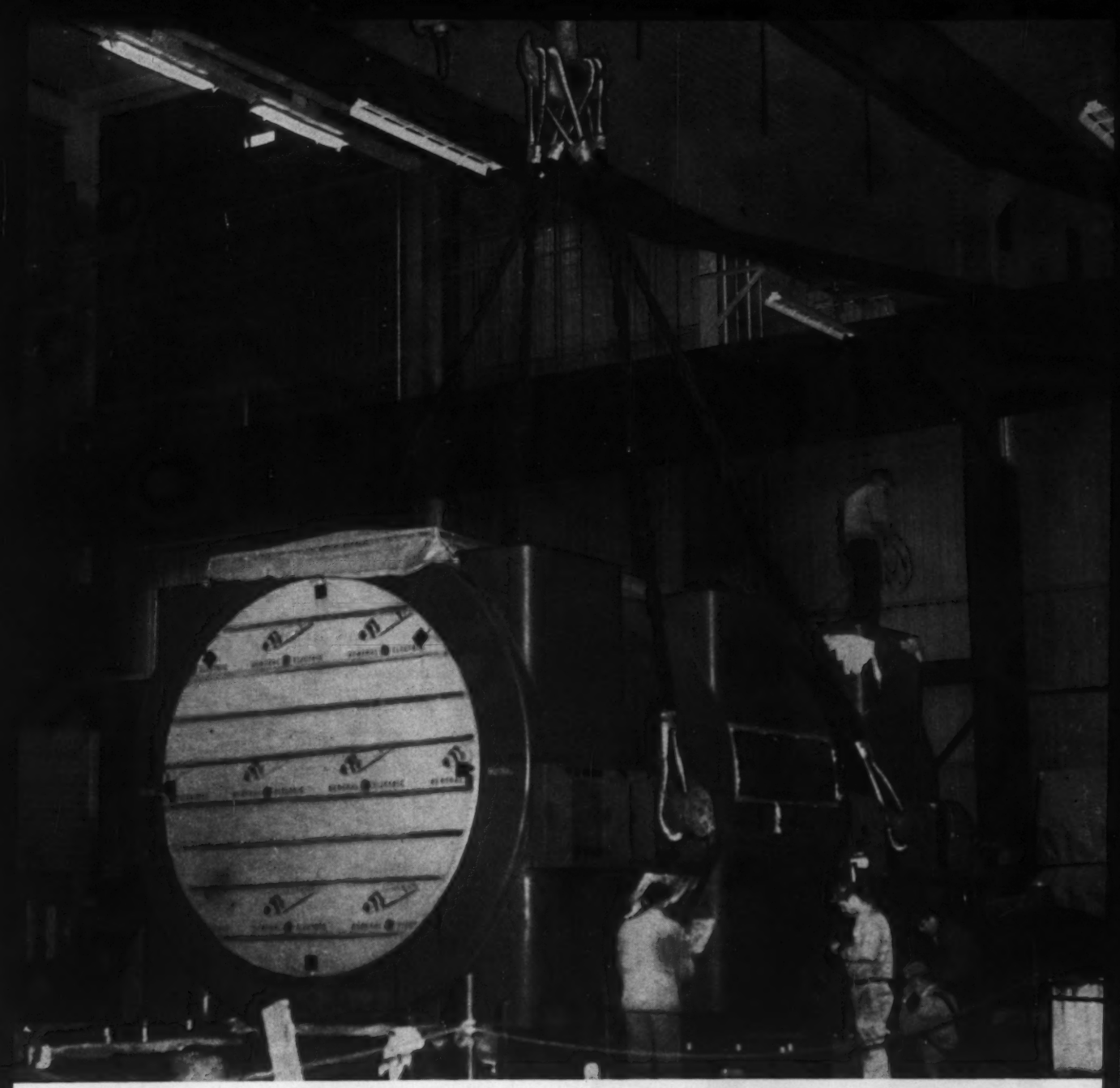
Because of mounting cost conditions, a user of motor-support springs asked for a complete design check. Redesigned by A.S.C. engineers, required stresses were met by a slight change in wire size, allowing a reduction in number of coils from 10 to 7. This meant a saving of 70 pounds of material per thousand springs. Because of the shorter length of wire, coiling and grinding speeds were increased, heat-treating time reduced. Saving to the customer—40%.

How about the springs you use? A consultation on your specifications costs you nothing. Just contact any Division of Associated Spring Corporation. For a handy reference to spring action, write for "Spring Design and Selection—in brief."

Associated Spring Corporation

General Offices: Bristol, Connecticut

Wallace Barnes Division, Bristol, Conn. and Syracuse, N. Y.
B-G-R Division, Plymouth and Ann Arbor, Mich.
Gibson Division, Chicago 14, Ill.
Milwaukee Division, Milwaukee, Wis.
Raymond Manufacturing Division, Corry, Penna.
Ohio Division, Dayton, Ohio
F. N. Manross and Sons Division, Bristol, Conn.
San Francisco Sales Office, Saratoga, Calif.
Seaboard Pacific Division, Gardena, Calif.
Cleveland Sales Office, Cleveland, Ohio
Dunbar Brothers Division, Bristol, Conn.
Wallace Barnes Steel Division, Bristol, Conn.
Canadian Subsidiary: Wallace Barnes Co., Ltd., Hamilton, Ont. and Montreal, Que. Puerto Rican Subsidiary: Associated Spring of Puerto Rico, Inc., Carolina, P.R.



3/4 MILLION DOLLAR LIFT!

379,000 pounds of extremely valuable equipment are shown being lowered onto a base at the Central Illinois Light Company's new plant near Peoria, Illinois. This is a generator stator capable of producing 125,000 KW of electricity and is the largest unit on the CILCO system.

Contractor on the job was J. F. Pritchard and Company, who entrusted the ¾ million dollar lift to B & B Braided Safety Slings. As expected, the slings were worthy of that trust. The job was performed without a hitch and the stator was installed in perfect condition.

When lives—time—and valuable equipment are at stake, entrust your heavy lifts to Yellow Strand Braided Safety Slings. They live up to expectations! Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.

Yellow Strand.®

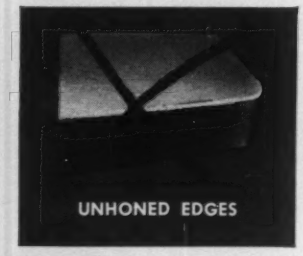
Metallurgical Memo from General Electric

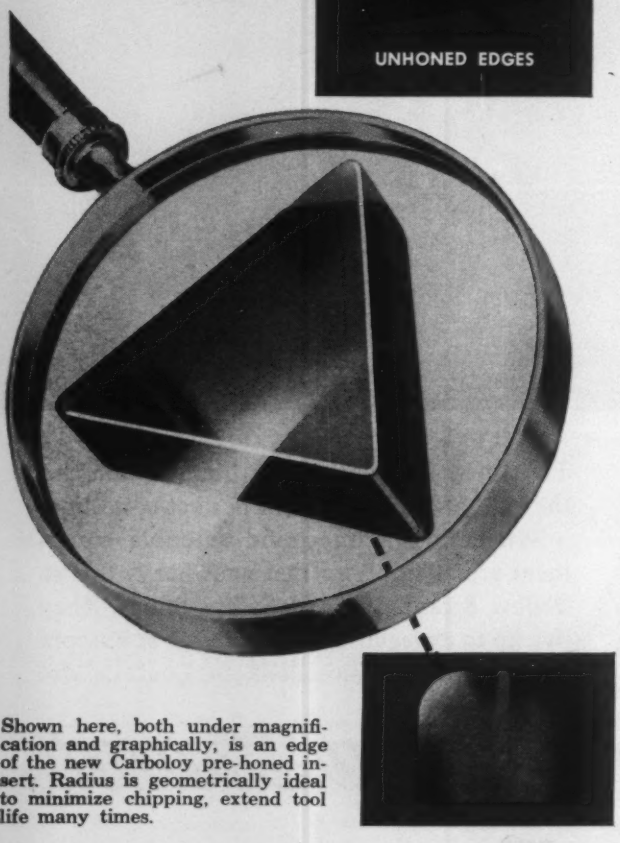
General Electric announces pre-honed CARBOLOY® inserts

Hand-honing is inaccurate, and time-consuming—frequently results in premature chipping and breaking.

Chamfered, or ground-flat, edges are geometrically weaker than a radius and are more easily chipped or broken.

Unhoned or as-ground inserts show rough edges—result in unpredictable tool life due to chipping.





Shown here, both under magnification and graphically, is an edge of the new Carboloy pre-honed insert. Radius is geometrically ideal to minimize chipping, extend tool life many times.

Now you get more predictable tool life... lower cost per cutting edge ...no hand-honing cost!

Ready-to-use... honed to a precise radius... promise BETTER PROFITS THROUGH BETTER TOOLING

Now General Electric Carboloy inserts are pre-honed *at the factory!* Here's what it means to you:

1. An insert with edges honed to precise *radii* gives the strongest geometric shape to withstand cutting pressures. This reduces chipping – increases the predictability of tool life. Hand honing *cannot* achieve precise radii – G-E pre-honing can . . . and does!
2. Since chipping is minimized, fewer cutting edges are wasted. The result is lower cost per cutting edge.
3. Since inserts come pre-honed and ready-to-use, the labor cost of hand honing is eliminated. This more than offsets the charge for pre-honing.
4. Pre-honed Carboloy cemented carbide inserts have standard edge radii honed to a greater or lesser degree, depending on the job to be done. You'll *know* the honing is right!

Ask your Authorized Carboloy Distributor about pre-honed Carboloy inserts, convertible seats, toolholders, and brazed tools. Or, write: *Metallurgical Products Department of General Electric Company, 11153 E. 8 Mile Road, Detroit 32, Michigan.*

TOPS IN TOOLING QUALITY

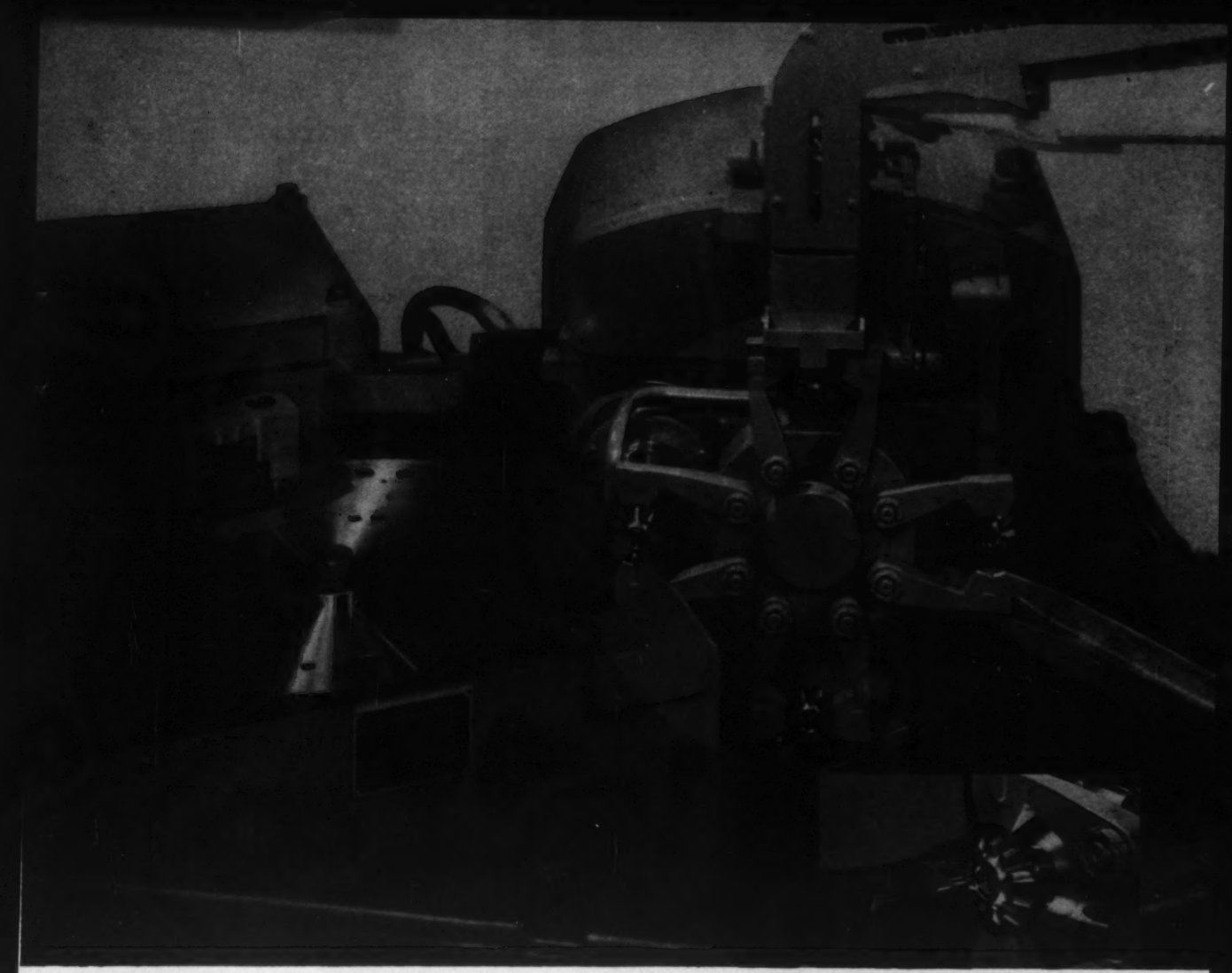
From the research and quality-control facilities of the Metallurgical Products Department of General Electric comes the outstanding quality tooling line in the metalworking industry. The new Carboloy pre-honed inserts, as well as the complete line of Carboloy toolholders, inserts, insert seats, convertible seats, and brazed tooling, are designed to meet every tooling need efficiently and economically.

CARBOLOY®
CEMENTED CARBIDES

METALLURGICAL PRODUCTS DEPARTMENT

GENERAL ELECTRIC

CARBOLOY® CEMENTED CARBIDES
MAN-MADE DIAMONDS • MAGNETIC MATERIALS
THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS



In Revacycle Method each blade of cutter is longer than its predecessor; there is no depthwise feed of cutter itself. One rotation of the cutter completes each tooth from the solid.

Fastest way yet to cut straight bevel gears

If you're looking for a faster, fully automatic way to cut straight bevel gears and pinions with conjugate surfaces and localized tooth bearings, consider the Gleason No. 109 Straight Bevel Revacycle® Machine.

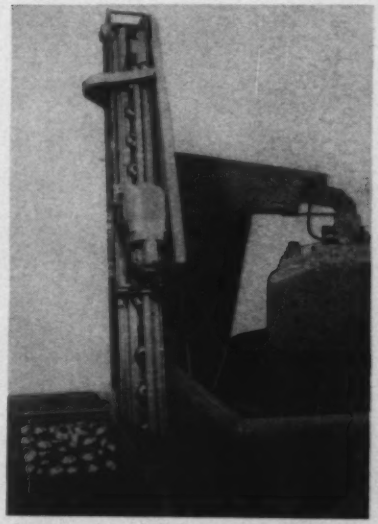
You rough, semifinish, and finish a gear from the solid blank with a single rotation of the Revacycle cutter.

Now both 21″ and 25″ diameter cutters can be used on the No. 109 Revacycle Machine. The 25″ cutter cuts gears to a maximum depth of 0.600″. The 21″ cutter will cut to a maximum of 0.400″.

A new, completely automatic mechanism loads and unloads each gear. You can feed this loader manually or with a conventional belt conveyer.

The No. 109 Machine handles a wide range of automotive and farm machinery gears: up to 10″ diameter, 5:1 ratio, 1¼″ face width.

Send for our bulletin for information on both the machine and the Revacycle Method.



Storage unit and flight conveyer can be fed manually or with belt conveyer. Even with manual operation, one operator can handle a battery of machines.

GLEASON WORKS

1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.

Gordon Lund

Purchasing Agent Harold Hammel discusses quality of finished cut on stainless bar stock with Bay State's Gordon Lund.

Cost is a vital consideration in the manufacturing of components for modern steam power and heating installations. And one of the largest and most successful manufacturers in this field is the Sarco Company, Inc., of Bethlehem, Pa. Their Thermo-Dynamic steam traps are famous wherever steam is used for heating or power.

The problem at Sarco was to cut square and octagon bar stock to size for the trap and keeping costs down was vitally important. At the direction of Sarco Purchasing Agent Harold Hammel, tests were run on band and hack-saw cutting as well as on the best available abrasive cut-off wheels.

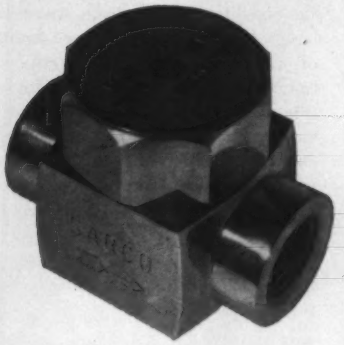
Bay State Abrasive Specialist Gordon Lund was asked to specify the wheel he figured would do the best job and results proved that he figured right. Not only were cut-off wheels in general 15-20% more economical than sawing but Bay State's resinoid bonded wheel beat other wheels by a substantial margin in time per cut and number of cuts per wheel.

Even more important than this, after the Bay State wheels had been in use for a period of time, Sarco rated them *tops for consistency*, too . . . another example of the way Bay State's relentless testing procedures pay off in wheels that give the same top performance wheel after wheel after wheel.

Like Gordon Lund, your own Bay State representative brings you the advantages of wide experience with grinding problems of all types . . . plus a complete line of high-performance abrasive products backed by research and test programs of unequalled effectiveness. *Better grinding at lower cost . . . that is our business.*

Bay State resinoid bonded wheel is shown cutting 420 Series stainless bar stock to meet requirements for maximum cuts per predetermined cutting cycle. (Guard raised for photography).

helped lower stainless cutting costs 15-20% at SARCO



Four years of bare-knuckles shop experience with a major automobile manufacturer plus six years experience as an Abrasive Specialist (both in-plant and in the field) give Gordon Lund an unusually broad knowledge of the metal-working industry in general and grinding techniques in particular.

BAY STATE ABRASIVES

BAY STATE WHEELS of PROGRESS

Bay State Abrasive Products Co., Westboro, Massachusetts.
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
Branch Offices: Chicago, Cleveland, Detroit, Los Angeles, Pittsburgh. *Distributors:* All principal cities.

NEW IDEAS IN COPPER ALLOY ROD AND WIRE

Interesting things happen when you add a spot of zirconium or chromium to copper—four high-conductivity coppers that boost production, cut cost of machining—even plain old free-cutting brass rod is going fancy.

There's a quiet revolution going on in copper metallurgy. Research and development teams are expanding the useful knowledge of copper and copper alloys in an effort to define the properties most suitable for specific engineering applications.

STABILITY at elevated temperature, combined with good electrical conductivity, is probably a combination most sought after by design engineers and by our industry's research teams. Two alloys are now commercially available, and the alloy systems are unique. Chromium copper and zirconium copper are heat-treatable alloys with good stability of mechanical properties up to temperatures in the order of 600 F.

CHROMIUM copper in the fully heat-treated condition following a solution anneal will exhibit properties combining a tensile strength of about 75,000 psi with conductivity of approximately 80% IACS. Zirconium copper has good stability characteristics at elevated temperatures and conductivity of 90 to 95% IACS; the strength properties developed by heat treating are, however, somewhat lower than chromium copper.

SEVERAL other heat-treatable copper alloys with intermediate properties are gaining recognition in the connector and electronics fields. These alloys fall into a conductivity range of 35 to 65% IACS, with tensile strengths 90,000 to 100,000 psi. The most popular alloy systems are the copper-nickel-phosphorus and copper-nickel-silicon series with modifications for free machining or other specific requirements. These alloys have a solution annealing temperature about 100 to 200 C lower than the chromium and zirconium coppers.

THE WIDESPREAD use of panel or harness construction for linking segments of electrical control devices has made the requirement for free-cutting coppers mandatory. Screw machine shops are fabricating these connector components of various designs by the millions. Currently the most popular free-cutting coppers are leaded copper with conductivity of about 98% IACS, and tellurium and sulfur coppers at about 95% IACS. Some of these free-cutting coppers have residual oxygen and can become brittle or gassed under the usual conditions contributing to this phenomenon. All, however, can be obtained with a combination of deoxidizers or oxygen-free copper. In the case of the deoxidized variety, some slight sacrifice in conductivity will be noticed. Ordinary usage very seldom requires conductivity in excess of 90% IACS – and this presents no problem for these coppers.

ALL of these coppers can be cold worked without too much trouble. They can be supplied in a suitable wire temper for cold heading and secondary operations designed around the basic alloy system. Up to now there has not been too much interest in these alloys for wire forming or heading operations. Close dimensional tolerances may be the reason for the reluctance of the heading people to get into the electrical connector business. Alloys are available with the ductility and mechanical properties necessary for this type of forming. It would appear that some of the products could be made more economically by cold-heading or wire-forming operations.

RECENT TRENDS have also affected the old brass and copper reliables. There can't be any product more prosaic than free-cutting brass rod; it is the cheapest of such commodities and at one time was the easiest to process—all one had to do was to extrude, draw to finish dimensions, and ship. In many cases this practice won't work today. Deep drilling, roll threading, knurling, staking, slotting, etc., have complicated the picture, but the latest efforts of the screw machine builders have laid this ghost to rest. We now hear of beta-free rod for close tolerances on deep-drilling applications. Similar grain structures, but not necessarily the same temper, are required for roll threading, knurling and staking or whenever extra ductility is needed. Along with the consideration of grain structure, it has been necessary to take advantage of the broad chemical composition range for free-cutting brass. Most suppliers divide the standard range into two parts, utilizing the lower copper range for the larger sizes that will normally be machined on the heavier, faster screw machines where chip breaking and clearing the tools are the most important considerations. This might be considered the rough, breakdown type of stock.

FOR the smaller diameters, specialization has been the watchword. Depending on specific needs, you can now obtain free-cutting brass rod with all-alpha, fine-grained structure or an alpha-beta fine-grained extruded structure, or possibly a combination of both. For certain applications you might need a coarse-grained, all-alpha structure. Lead dispersion and lead content are other variables that can and will be controlled to meet fabricating or end-use requirements.

IN the cold-heading industry, advantage is being taken of the wider selection of copper and copper alloys that is available today. The nickel silvers, phosphor bronzes, and silicon bronzes combine good ductility and high strength with excellent corrosion resistance. The whole range of common brasses has specific applications and can be tailored to various heading operations.

The research and development hopper is full of interesting new ideas and projects at The American Brass Company. It could be that we're working on something which would help solve one of your problems. Even though we don't have the complete answer, perhaps we could both reach a solution faster by pooling our efforts. Call your American Brass representative and talk it over with him or write: Manager, Market Planning, The American Brass Company, Waterbury 20, Conn. 6058

ANACONDA®

COPPER – BRASS – BRONZE

NICKEL SILVER MILL PRODUCTS

Made by

The American Brass Company

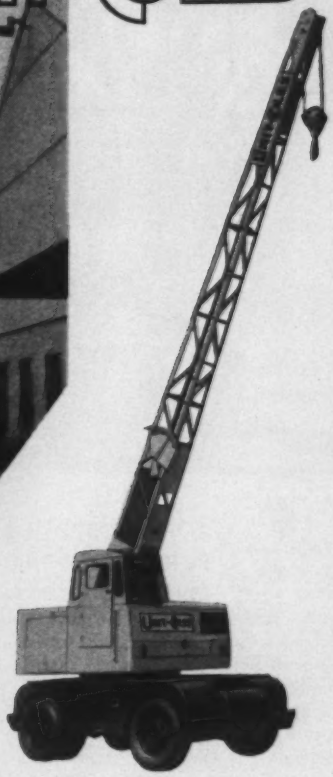
UNIT-COLES

WHAT MAKES **UNIT-COLES** BETTER THAN THE ORDINARY YARD CRANE?

IT'S THE ONLY CRANE WITH ALL MOTIONS ELECTRICALLY POWERED!

THERE'S NOTHING LIKE A UNIT-COLES MOBILE CRANE AND ITS UNIQUE GASOLINE-ELECTRIC OR DIESEL-ELECTRIC POWER PACK. LOAD-HOIST, SWING, BOOM-HOIST AND TRAVEL ARE **INDEPENDENTLY POWERED** BY SEPARATE ELECTRIC MOTORS WITH AN INFINITE RANGE OF SPEEDS. AT THE TOUCH OF A LEVER, THE OPERATOR RAISES OR LOWERS A LOAD QUICKLY, OR INCHES IT WITH PIN-POINT PRECISION.

THE MAN IN THE CAB FEELS SAFE AND SECURE, TOO, KNOWING THAT **THIS CRANE** WILL NOT LIFT AN UNSAFE LOAD, REGARDLESS OF LOAD RADIUS. UNIT-COLES' POSITIVE-ACTION SAFE LOAD INDICATOR AUTOMATICALLY PRE-WARNS HIM OF DANGEROUS LOAD CONDITIONS, THEN IMMEDIATELY "STOPS AND HOLDS" BOOM AND LOAD-HOIST MOTIONS IF WARNINGS ARE IGNORED.



other
UNIT-COLES
advantages include:

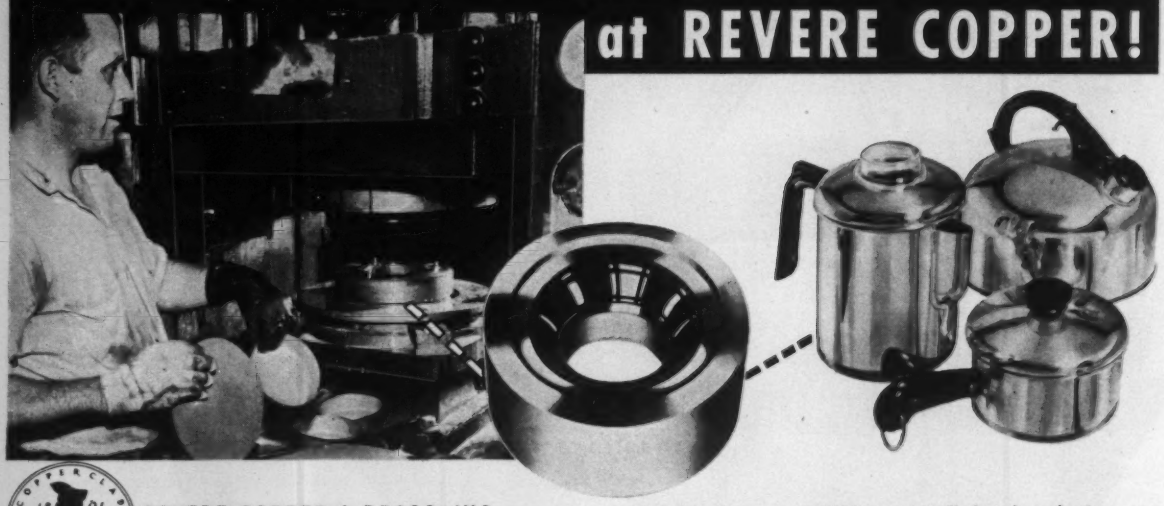
- "Dead-man control" devices that automatically return levers to neutral . . . "stop and hold" load in event of power interruption or accidental lever release.
- Fully automatic braking on all crane motions with "fail-safe" electro-mechanical brakes.
- Consistent "left-for-left" and "right-for-right" steering with cab in any position.
- No complex gear trains and clutches to maintain. Self-contained assemblies permit quick servicing, easy replacement.
- Shortest tail swing and turning radius of any American made fully-revolving crane.

UNIT-COLES Mobile Cranes have a heavy duty, self-propelled chassis and are available in capacities ranging from 5 to 55 tons. Write today for details on the complete line and the name of your nearest dealer.

UNIT
UNIT CRANE & SHOVEL CORP.
6705 W. Burnham Street
Milwaukee 19, Wisconsin

ANOTHER TALIDE CASE HISTORY . . .

Talide® Dies Cut Maintenance Costs at REVERE COPPER!



REVERE COPPER & BRASS, INC., ROME, NEW YORK, producers of copper clad, stainless steel kitchenware

found aluminum bronze dies gave better production than steel alloy dies, but maintenance costs still remained high. Over 500,000 one-quart sauce pan bodies were being drawn with each aluminum bronze die costing $250, but it cost another $900 to maintain the die in operation.

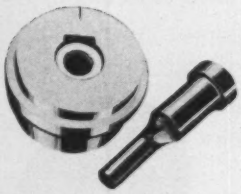
It was necessary to hand polish the die in the press every 2,000 pieces. After each 10,000 piece run, the die had to be taken to the tool room to have .010 to .030 of stock removed from face to clean up. Downtime and maintenance expense was costly.

A Talide die costing $1150 was installed and production now averages over 1,000,000 pieces with no visible wear. It was only necessary to hand polish the carbide die several times during the break-in period while drawing the first 30,000 pieces, with subsequent servicing negligible. More uniform, accurate-to-size parts are produced with scoring eliminated. No subsequent buffing operation on the piece part is required.

During the past 15-year period Revere Copper has installed over 30 Talide dies on their production line—pressing to shape a broad variety of kitchenware items, including sauce pans, covers, double boilers, percolators, handles, etc. Although millions of piece parts have been drawn to date, no Talide die has yet been worn out!

WIRE DIES

Hundreds of miles of steel and non-ferrous wire—.004 to .750—drawn through TALIDE dies.

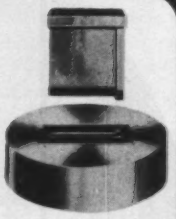


COLD EXTRUSION DIES

50 times more valves and tappets cold extruded with solid TALIDE punches and dies.

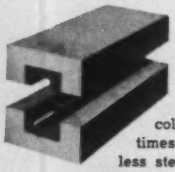
BLANKING AND FORMING DIES

70 times more paper discs blanked out with TALIDE—over hard alloy die.



CURLING ROLLERS

TALIDE curling rolls last 65 times longer than steel rolls on beverage can forming operation.



SWAGING DIES

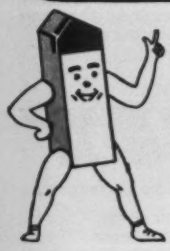
Leading fountain pen manufacturer cold swages 33 times more stainless steel parts with TALIDE dies.

HEADING AND EXTRUSION DIES

Cold heading ¼" C-1008 rivets, TALIDE dies produced 11,200,000 pieces, other carbide dies only 3,500,000.

POWDERED METALLURGY DIES

Compacting highly abrasive chemical powders, TALIDE pill dies last 4 months; steel dies wore out in 6 hours.



A Talide die engineer can help you cut costs and increase production on draw presses, punch presses, pill presses, cold headers, swagers and draw benches.

METAL CARBIDES CORP.
6001 Southern Boulevard
Youngstown 12, Ohio
Send for 68-Page Catalog 59-G

METAL CARBIDES CORPORATION
MC
TALIDE®
YOUNGSTOWN 12, OHIO

HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

"Can't wedge ...it's cylindrical"

ACF® Lubricated Plug Valves

There's no taper to cause sticking or wedging in an ACF valve. And the plug can't be unseated.

The baseplate spring and line pressure hold the plug tight against the Teflon head seat gasket. All friction surfaces are constantly lubricated for easy quarter-turn operation and protection against corrosion.

Next time — and every time — specify ACF! *Available from leading suppliers everywhere.*

WRITE FOR CATALOG 400

W-K-M

DIVISION OF ACF INDUSTRIES INCORPORATED
P. O. BOX 2117, HOUSTON, TEXAS

ACF semi-steel lubricated Plug Valves are available in rectangular, round, diamond, and V ports; venturi, multiport and steam-jacketed models.

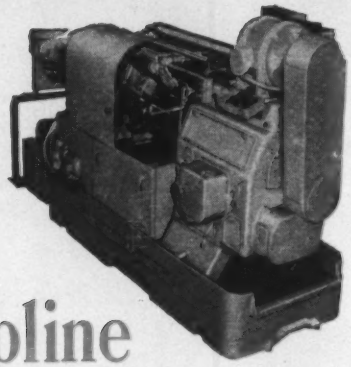
Materials: steel, semi-steel, Ni-resist, carbon steel, bronze, aluminum.

Sizes: ½" through 30".

Working Pressures: 125 through 800 pounds.

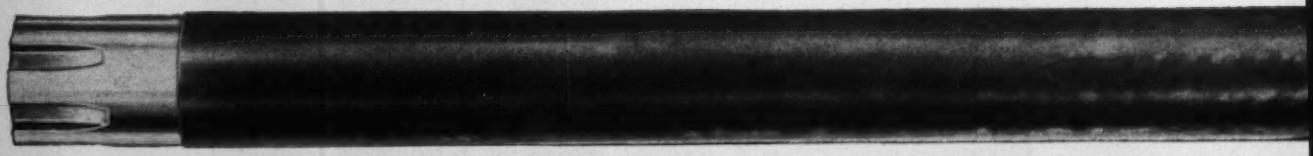
PRODUCT OF W-K-M's *Creative Engineering*

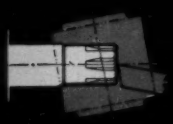
5910-R



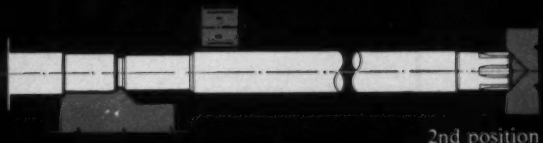
Acme-Gridley performs spline hobbing in a single set-up . . .

slashes ringer roll shaft production time 63%!

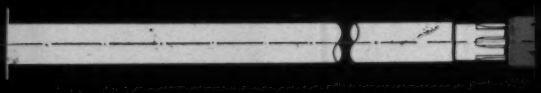




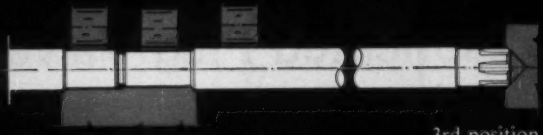
5th position
Hob Spline—Face Front (spindle clutch disengaged, spindle driven from hobbing attachment)



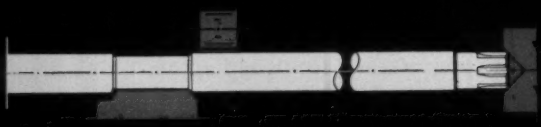
2nd position
Form Spline Dia. of Next Piece and Breakdown for Cut-off—Support



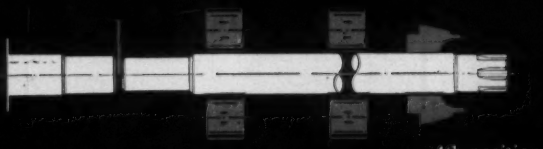
6th position
Feed Stock



3rd position
Shave Rear Dia. and Spline Dia.—Support



1st position
Form Rear Dia. Past Cut-off—Support



4th position
Support—Pick-up—Cut-off

6 Operations in 27.9 Seconds

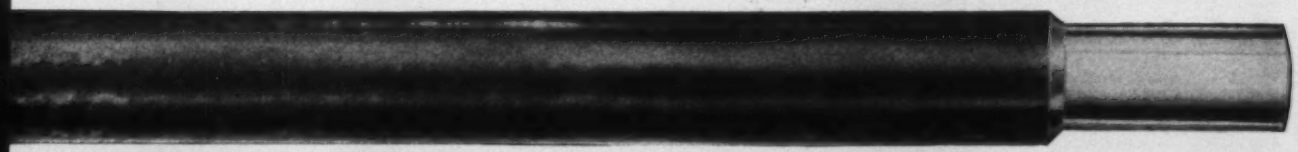
Here's how imaginative National Acme solutions to tough machining problems extend total machine capability and pay off in *tangible* production savings.

Spline hobbing is generally considered beyond automatic bar machine capability. Yet, an ingenious National Acme hobbing attachment . . . installed on an Acme-Gridley 1¼" RA-6 with modifications . . . lets a well-known manufacturer of ringer roll shafts do spline hobbing in the primary set-up; has cut per-piece production time 63%. In addition, a unique automatic feeding arrangement has drastically reduced stock-loading downtime.

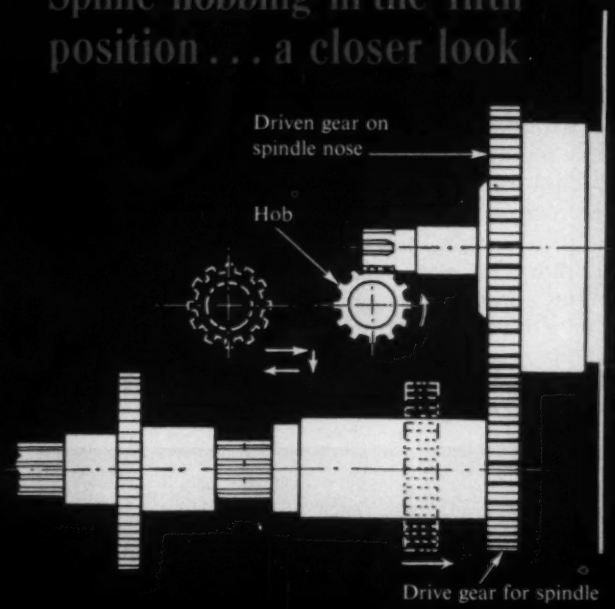
Special attachments like the spline hobber, plus such standard features as direct camming, independently operated toolslides, and a wide open tooling zone are the reason Acme-Gridley capability is limited by imagination only. No wonder cost-conscious manufacturers everywhere depend on Acme-Gridleys for higher mass production efficiency at lower cost. Detailed information on the world's most complete line of multiple and single-spindle automatic bar and chucking machines is yours for the asking. Call, write or wire.

National Acme's "Zone of Responsibility" includes all phases of cost reduction. Check YOURS . . . Then Check National Acme.

Direct Costs: these include direct dollar savings as realized by thousands of manufacturers . . . an "everyday" job for Acme-Gridleys. **Indirect Costs:** effecting important savings in maintenance, downtime, scrap reduction, tool costs, etc. **Product Redesign:** teaming with your design group to take full advantage of Acme-Gridley's cost reducing capabilities. **Direct Material Costs:** our engineers provide important savings in this area by constantly matching machines and tools to modern metallurgical problems. **Make-or-Buy Reviews:** in many cases our Contract Division can assume your production headaches and relieve you of immediate capital investment. **Spot Modernization:** pioneering in modern tooling methods, and the flexibility of Acme-Gridleys can provide many "on-the-spot" savings.



Spline hobbing in the fifth position . . . a closer look.



When the hobbing attachment advances, a gear on the attachment engages a gear on the spindle nose and drives the spindle at the required speed for hobbing.

MMT-PE
MODERN MACHINE TOOLS
PRODUCTION EFFICIENCY

National Acme

THE NATIONAL ACME COMPANY
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Sales Offices: Newark 2, N. J., Chicago 6, Ill., Detroit 27, Mich.

Sudden Splash or Soaking Shower

won't stop a Wagner® DP Motor . . .

Wagner® Type DP Motors are doubly protected by rugged, corrosion-resistant cast iron frames and dripproof enclosures. Splashing or falling liquids, corrosive acids, salts, and alkalies can't stop their smooth operation. Designed to meet a wide variety of applications—including many that used to require splashproof motors—Wagner Doubly Protected Motors pack plenty of power into precious little space, are lightweight, long-lived, and pare downtime and upkeep costs to the bone. Simply put . . . they get the job done. Let your nearby Wagner Sales Engineer show you how these motors can be applied to your needs. Call him, or write for Bulletin MU-223.

Wagner Electric Corporation

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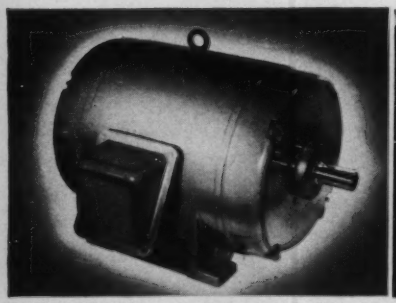
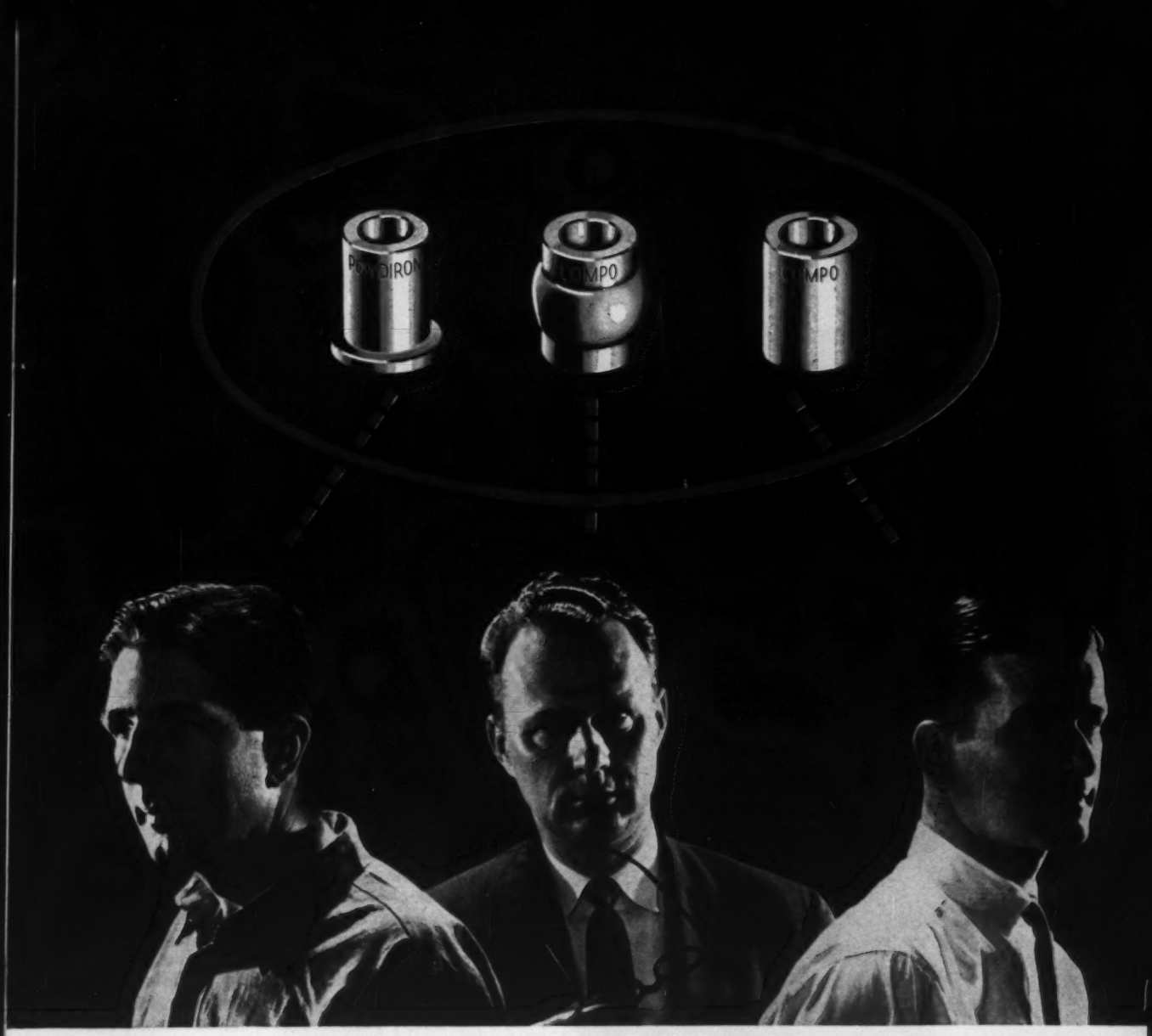


SLEEVE BEARING MODELS AVAILABLE . . . DP Motors are built in NEMA frame sizes 182 through 445U; 1 through 125 hp—1750 RPM—40°C; available with ball bearing construction as illustrated or steel-backed, babbitt-lined sleeve bearings. Larger motors (Type RP) are available through 1000 hp.

CAN BE RELUBRICATED . . . Original factory lubrication will last for many years in normal service, but openings are provided to permit the relubrication that adds years to motor life under severe conditions.

COOL RUNNING . . . Specially designed baffles direct cooling air through the motor to reduce stator temperature, thus increasing motor life. Blowers, cast as part of the rotor, move large volumes of air without noise or vibration.

WH60-20



Specialization in bearings enables us to apply to your bearing problems an unmatched engineering talent and experience in powder metallurgy. You benefit, too, from outstanding manufacturing facilities, including the world's largest inventory of dies. Whatever your need, when it's bearings, see the bearing specialists... see Bound Brook.

BOUND BROOK

Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
Pioneer in Powder Metallurgy Bearings and Parts.
Plants at Bound Brook, N.J. and Sturgis, Mich.

Tony Kueber knows how

Tony Kueber, President of Steel Warehousing, has good reason to be proud of the company's growth in stainless steel sales and reputation to service every stainless order that comes along. Under his leadership, the people who work with him have made a habit of prompt service. A fine example of intelligent management, Tony counsels salesmen, inspects the shop on occasion and never hesitates to pick up a ringing phone to take an order for stainless steel. His foresight has meant modern warehousing practices.

Although their average order is about 1,000 pounds, Steel Warehousing is equipped and willing to handle orders of any size. All orders are processed by a streamlined paper system. The service is fast . . . they often ship orders the same day, and they have as many as 20 trucks

to move stainless steel

in operation during peak periods.

Steel Warehousing's plant equipment is outstanding... the stainless steel plate flame and heli-arc cutting operation has been described as tops in the entire Midwest. They have metallurgists and engineers available for consultation. They also have extensive testing equipment. Small wonder they've increased stainless steel sales every year since they began to stock it.

Beloit Iron Works, Beloit, Wisconsin, is one of Steel Warehousing's many satisfied stainless customers. Beloit Iron Works buys stainless steel to make processing equipment for the pulp and paper industry. For example, they buy Type 304 stainless plate to make suction boxes that remove moisture from wet pulp and come in contact with highly corrosive chlorates, chlorites, sulfates and sulfites. That's why Beloit Iron Works makes the suction boxes of stainless steel. It's a clean material, strong and highly corrosion resistant. Stainless will keep the boxes performing for years and avoid corrosion failure that could cause shutdowns costing thousands of dollars per hour. Beloit Iron Works knows that stainless can be fabricated with normal care. They take their time in cutting, shaping and welding the stainless steel parts. The results are excellent.

It pays to use the right material from the start. Stainless Steel has a reputation for costing less in the long run because of its unmatched combination of strength, corrosion resistance and high temperature properties. *USS is a registered trademark*

This mark tells you a product is made of modern, dependable Steel.

USS United States Steel

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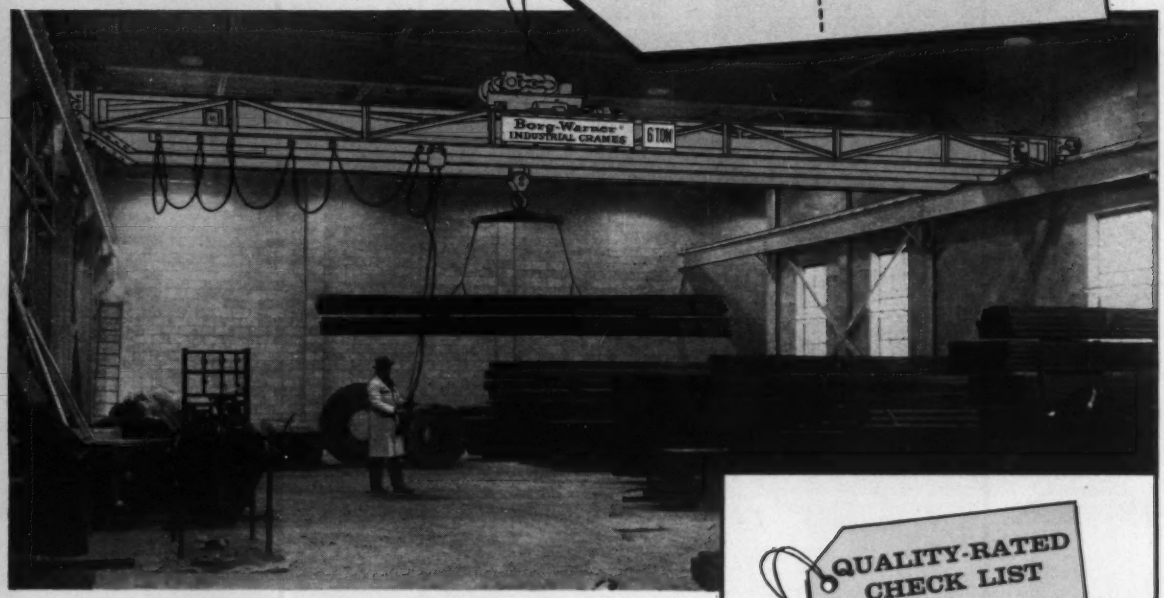
A Borg-Warner QUALITY-RATED Crane

$7900.00 for a 6-ton, 46 ft. Span 3 Motor, Top Running, Double Girder Industrial Service Crane



Standardization plus Advanced Engineering.

Borg-Warner crane engineers and production specialists have come up with important economies through extensive use of standardized, interchangeable components. These savings are passed along to you, giving you more for your money when you specify Borg-Warner Industrial Cranes.

An efficient, modern crane system may cost far less than you think. Owners of existing crane systems usually overestimate the cost of new equipment.

If you're planning a new plant, or if you are planning to expand or modernize, get all the facts about Borg-Warner QUALITY-RATED cranes. They're your best VALUE in overhead material handling equipment.

QUALITY-RATED CHECK LIST

- Full 6 ton rating with ample reserve capacity.
- Cambered bridge girders.
- Heavy-duty double reeved hoist.
- Heavy-duty rolled steel wheels.
- Rotating axles on bridge and trolley.
- Totally enclosed gearing.
- All welded, jig-assembled end trucks.
- Precision ball and roller bearings throughout.
- Precision assembly with fitted bolts in reamed holes.
- Totally enclosed crane and hoist duty motors.
- Magnetic bridge brake.
- Heavy-duty double reduction bridge drive.
- Full magnetic push-button control.

A maximum value at $7,900.00.

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Distributors in all principal industrial cities.

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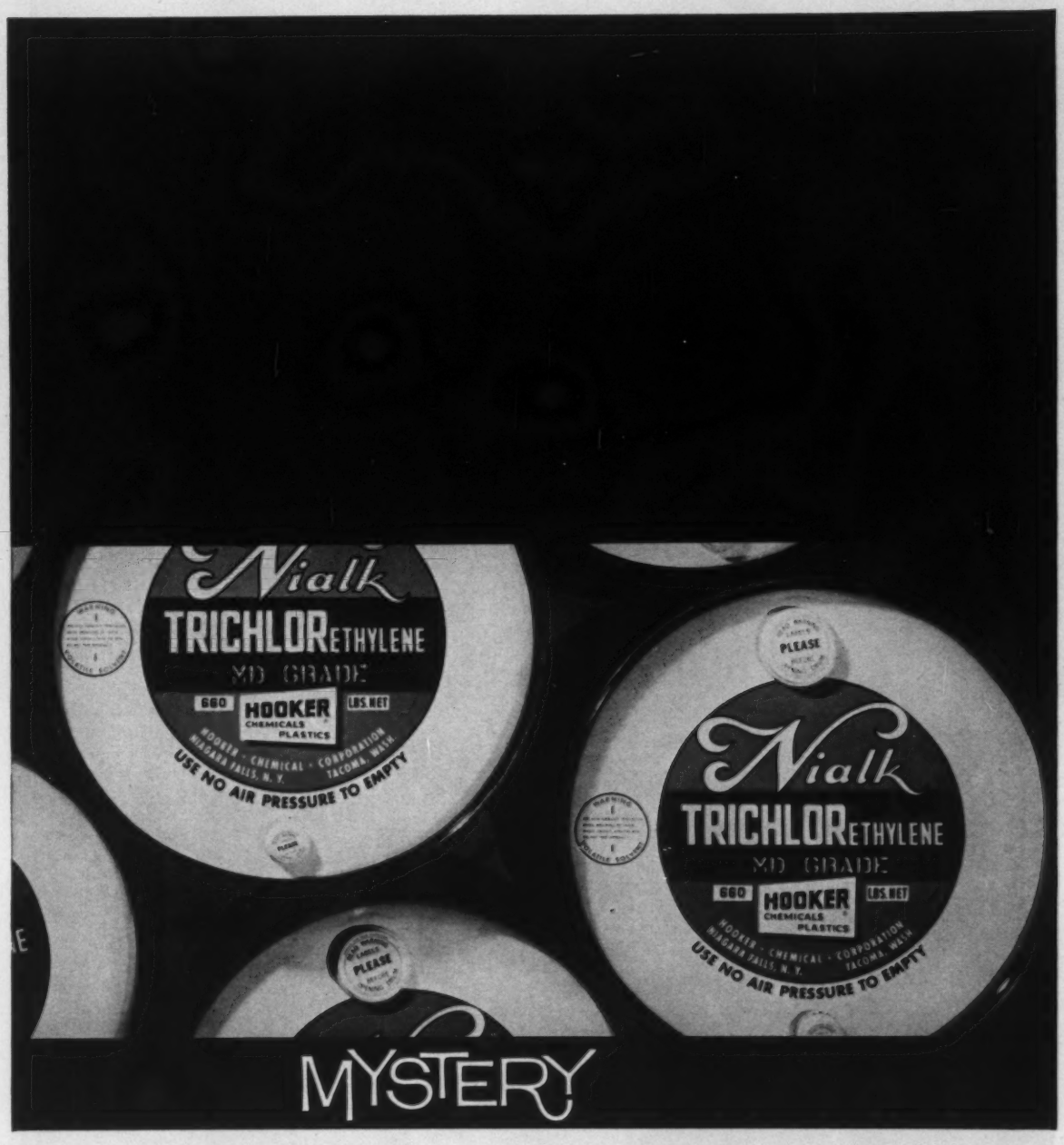
Export Sales: Borg-Warner International, 36 South Wabash St., Chicago 3, Illinois



HOW ONE GRADE DOES TWO JOBS

Nialk® MD Grade Trichlorethylene is pure enough for flushing missile components and low enough in cost for degreasing. That's because we've made it non-impact sensitive in the presence of liquid oxygen and because we've held residue on evaporation to 0.0005% max.

Because one and not two grades is needed, you cut your inventory, lower your costs, avoid mistakes.

Another thing that makes Nialk Trichlorethylene so good is PSP (permanent staying power). A neutral stabilizer system protects against heat, air, light, moisture, acids and active metals. It can't wear out, doesn't let your solvent go sour.

If you would like complete information on Nialk Trichlorethylene, ask for Bulletin 44A and Data Sheet 814. Meanwhile, why not try a few drums (or a tank car) of Nialk brand. You will find that your trichlor dollars buy more at Hooker.

Nialk® Trichlor, a product of

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Quality control at Standard is second to none among the nation's major specialty product steel plants. It is maintained by the most accurate, up-to-date testing equipment available. The laboratory facilities operate around the clock to keep all vital information flowing to our metallurgists, shop foremen, mill and machine operators—as well as to plant management, and, of course, our customers.

Bring your next unusual product to us—we'll welcome the opportunity to serve you regardless of the alloy it might require. Send for the free illustrated booklet, "Quality Control at Standard."

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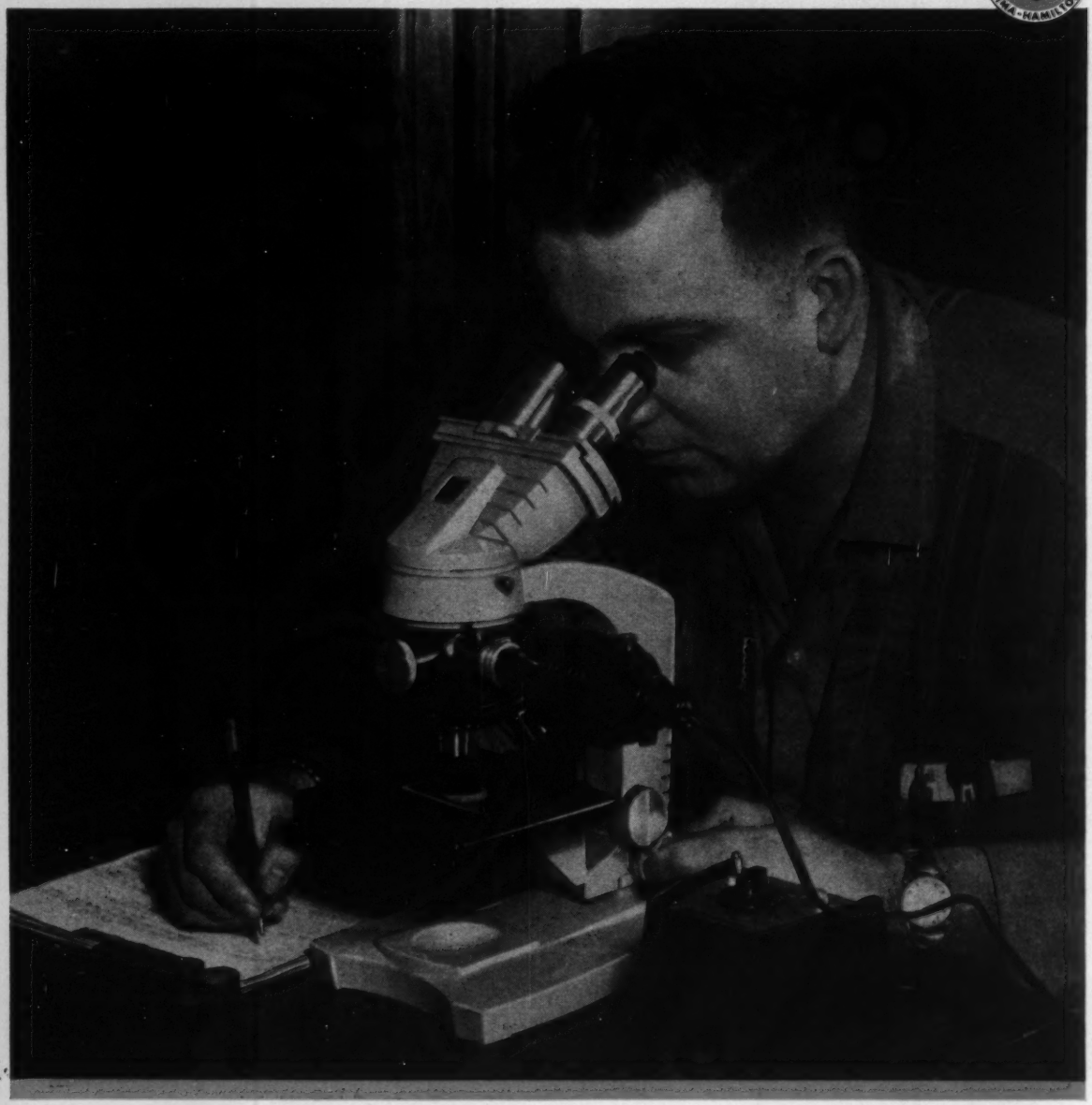

High strength aluminum castings without heat treatment:

TENZALOY

THE SELF-AGING ALUMINUM ALLOY

Tenzaloy is a corrosion resistant aluminum alloy that ages at room temperatures, delivers high strength properties without costly solution treating, quenching, and artificial aging. No special foundry techniques are required; no fluxes. Castability is excellent with sand cast and plaster molds, and many permanent molds. Tenzaloy castings have superior machinability, take a brilliant polish, anodize clear white. Write for TENZALOY Bulletin No. 103 to: Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, N. Y., or call your nearest Federated sales office.

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AMERICAN SMELTING AND REFINING COMPANY

FEDERATED METALS DIVISION

This transmission shift housing is one of several truck engine parts now cast of Tenzaloy for high strength without weight.

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New cutting tool materials... through metallurgical research

Years of research, experimentation and comprehensive testing have been devoted to every type of product being manufactured at V-R. By working closely with all types of industry, this metallurgical knowledge is effectively applied to meet industry's ever-changing demands for new cutting tool materials.

Above is a V-R metallurgist checking specific gravity of a metal sample on an ultrasensitive scale. Research, such as this, provides the basis for developing new cutting tool materials; for example, VR-65, a new titanium cemented carbide grade, for ultra high speed machining on *all* types of steel.

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- determine the advantages of wide-belt sheet polishing
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the men and machines in this building can help you

This is "Abrasive Tech" the Product Engineering Department of Behr-Manning Co.; inside are assembled the most modern production equipment and prototypes of the newest machines for every phase of coated abrasive grinding and polishing of every known material.

Inside are "Abrasive Tech" specialists — engineering and production experts whose job is to devote their time, skill and energies to helping you solve your problems. And they know their business. There are also Behr-Manning Machinery Methods Rooms in 16 conveniently located branches to help you in exactly the same way. Write for a detailed brochure of "Abrasive Tech" Product Engineering facilities and a list of the machinery at your service. Dept. IA-7, BEHR-MANNING Co., Troy, N. Y., a Division of Norton Company.

Branches in: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Grand Rapids, High Point, Indianapolis, Los Angeles, New York, Philadelphia, St. Louis, San Francisco, Seattle.

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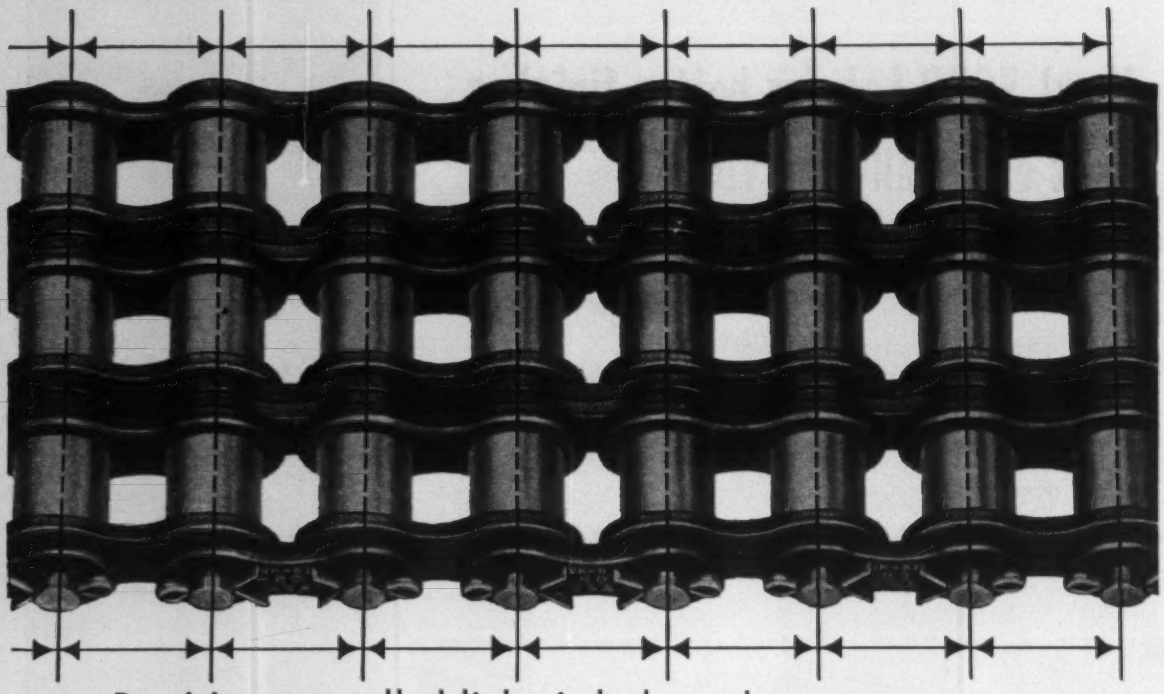


Precision controlled link pitch throughout
LINK-BELT roller chain means

equal length... equal strength

How pre-stressing ensures uniform load distribution of multiple-width LINK-BELT roller chain

Pre-stressing is one of the reasons why Link-Belt multiple-width precision steel roller chains easily handle the grueling loads common on today's drives. It seats and cold works the chain joint parts, assuring equal load distribution across the chain, minimum initial elongation, increased fatigue life.

Pre-stressing is just one of many "extras" that contribute to the *greater dynamic strength* of Link-Belt roller chain. Others include: close heat-treat control, lock-type bushings, shot-peened rollers, pitch-hole preparation. For details see Book 2657.

PRE-STRESSING MACHINE provides the pull that "sets" the parts of Link-Belt multiple-width roller chain. Besides assuring uniform load distribution, pre-stressing eliminates application difficulties on fixed center drives because the chain leaves the factory at precise operational length.

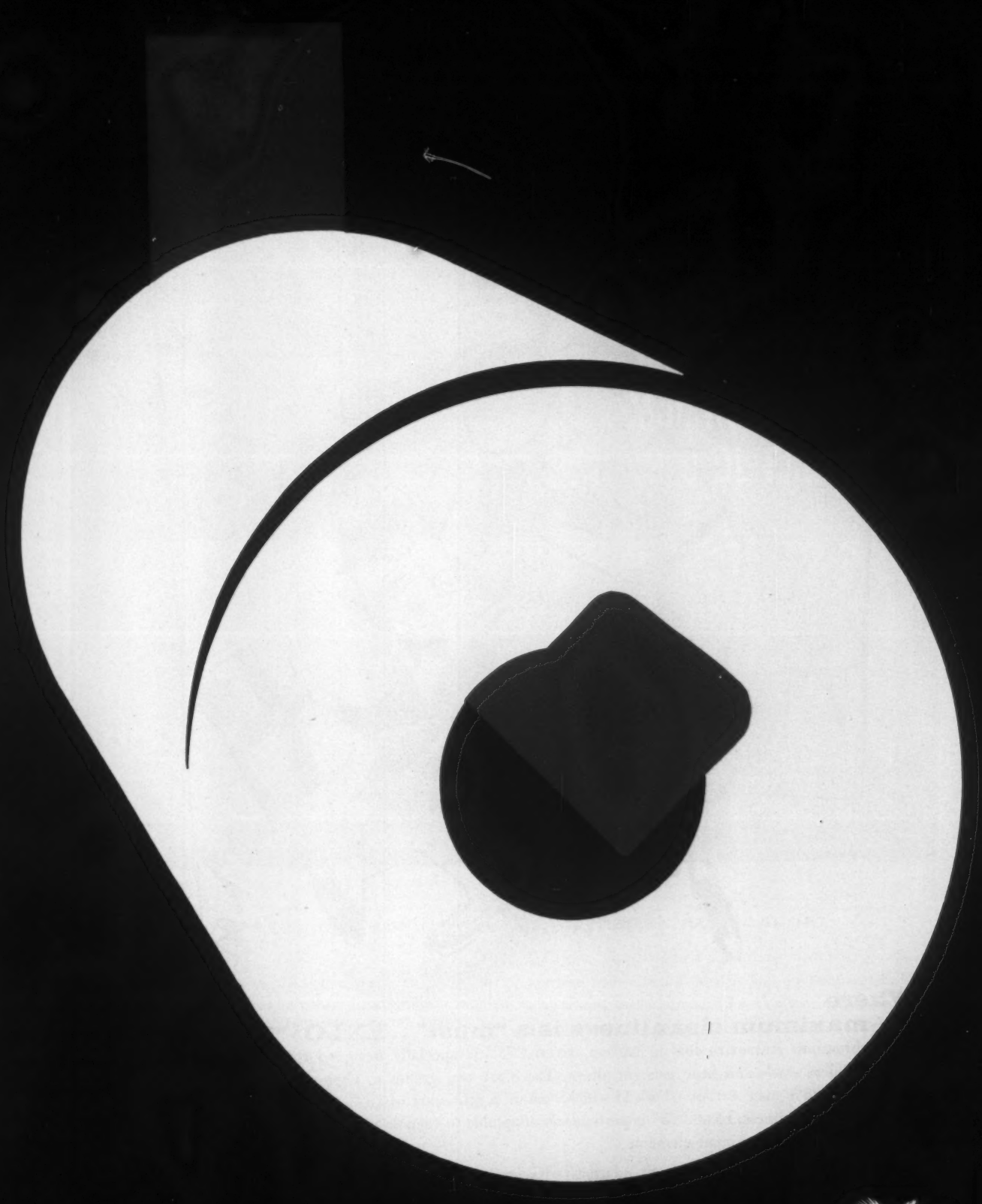
LINK-BELT

ROLLER CHAINS AND SPROCKETS

BOOK 2657 has 154 pages of roller chain data. Contact your nearest Link-Belt office or authorized stock-carrying distributor. (See CHAINS in the yellow pages of your phone book.)

15,361

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.



For tin plate, light and intermediate gauge sheet, long terne and coating lines, Palmoshield is custom tailored to optimum mill speed and other requirements.

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SHIELD PRODUCTS

For all-domestic roll oils, address The Ironsides Company, Columbus 16, Ohio, compounders of Shield lubricants.

Where maximum cleanliness is a "must"... EXLO® "75" Extra high in chromium and extra low in carbon, EXLO "75" is specially designed for use in very low-carbon stainless steels and heat-resistant alloys. There are two grades to choose from—.015% max. carbon and .025% max. carbon—both of which contain a minimum of 75% chromium. Because of its exceptional cleanliness, EXLO "75" is particularly adaptable to vacuum melting and other processes requiring minimum contaminant elements.

And don't forget the EXLO Standard Grades for use in low-carbon stainless and heat-resistant steels, irons and alloys. Like all EXLO ferrochromium alloys, they have high density and maximum cleanliness. Write for information or call your nearest VCA District Office. Vanadium Corporation of America, 420 Lexington Avenue, New York 17, N.Y. · Chicago · Cleveland · Detroit · Pittsburgh.

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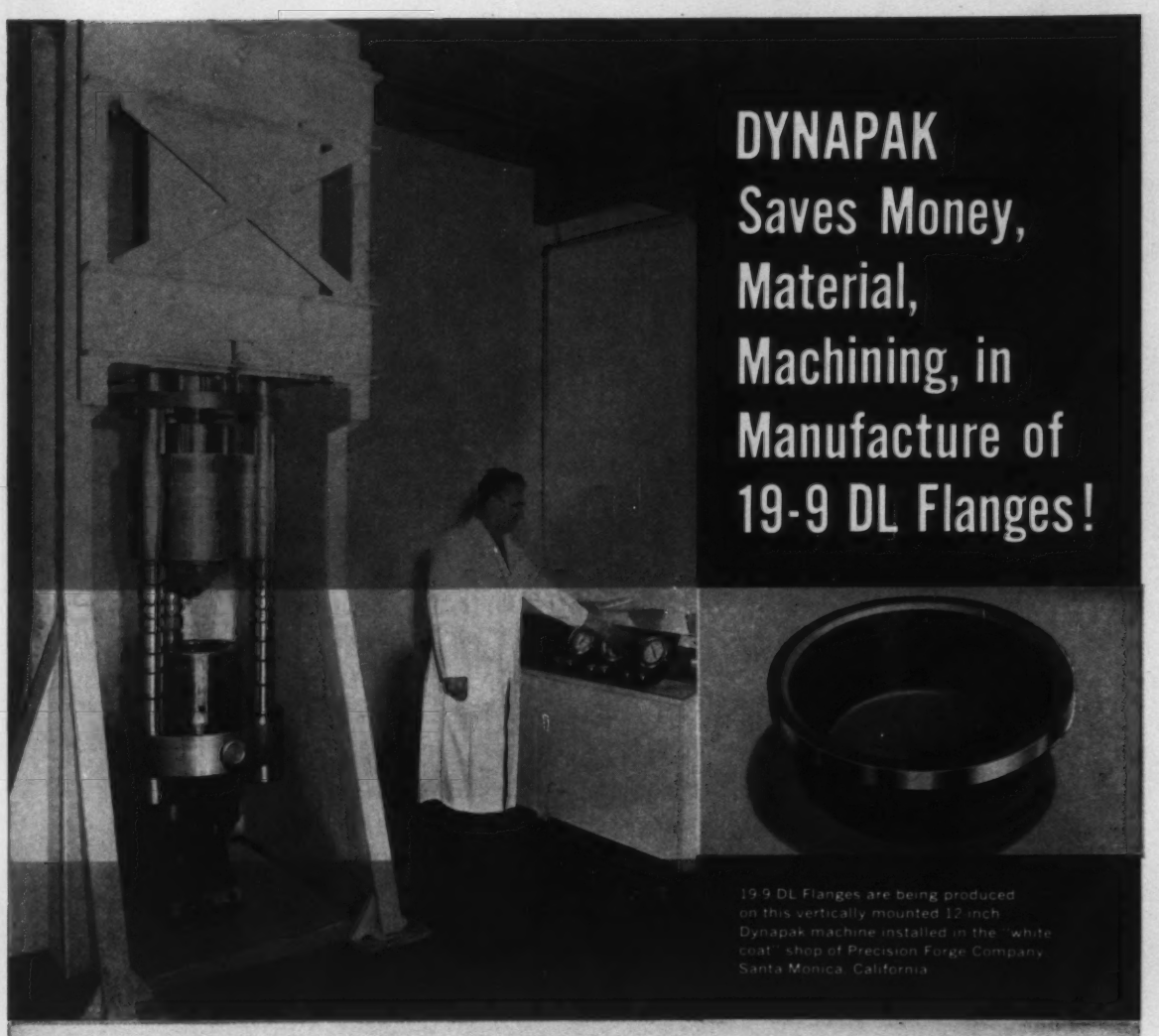

DYNAPAK Saves Money, Material, Machining, in Manufacture of 19-9 DL Flanges!

19-9 DL Flanges are being produced on this vertically mounted 12-inch Dynapak machine installed in the "white coat" shop of Precision Forge Company, Santa Monica, California.

Here are the savings achieved in this Dynapak Application:

- MATERIAL: 60%
- TOOLING: 50% of the cost of conventional forging dies
- MACHINING: Reduced by more than 50% due to forging tolerances of 1/32 in. and elimination of draft angle.

PLUS

- PRODUCTION RATES: 70-80 per hour
- SUPERIOR PHYSICAL CHARACTERISTICS: Greater strength, uniform and controllable work-hardening, Grain Size No. 11.

Dynapak, industry's first operational high-energy-rate machine tool, offers a breakthrough in metalworking's long-sought goal to produce forgings that can be used with little or no machining. This flange is just one of many forgings now being produced commercially by Dynapak. For complete information regarding application of pneumatically-energized Dynapak in your forging, extrusion, forming, or compaction operations, write, wire, or phone:

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INTERNATIONAL SILVER ANNEALS 35,000 LBS. OF BRASS & CUPRO-NICKEL A DAY

in these Power Convection bases

One man is now as productive as many 2-or-3 man annealing departments, and the tools that make him so valuable are these Surface Power Convection* annealing bases. Along with his production rate of 35,000 lbs. a day, he gets exceptional quality in his finished brass and cupro-nickel coils. Power Convection equipment never lets the temperature vary more than 10°F from top to bottom of a load. While one load is heating or soaking, a second is cooling, and the operator prepares the third load on its tray. A single crane handles all loading and unloading.

All the operator does to start a heating cycle is make a single electrical connection between cover and base. The International Silver Company, Meriden, Connecticut, is one of many manufacturers who are realizing higher earnings from Surface Power Convection equipment. You can be another, simply by calling Surface Combustion, 2373 Dorr Street, Toledo 1, Ohio. In Canada: Surface Industrial Furnaces Ltd., Toronto, Ont.

*Trademark of Surface Combustion, Division of Midland-Ross Corp.

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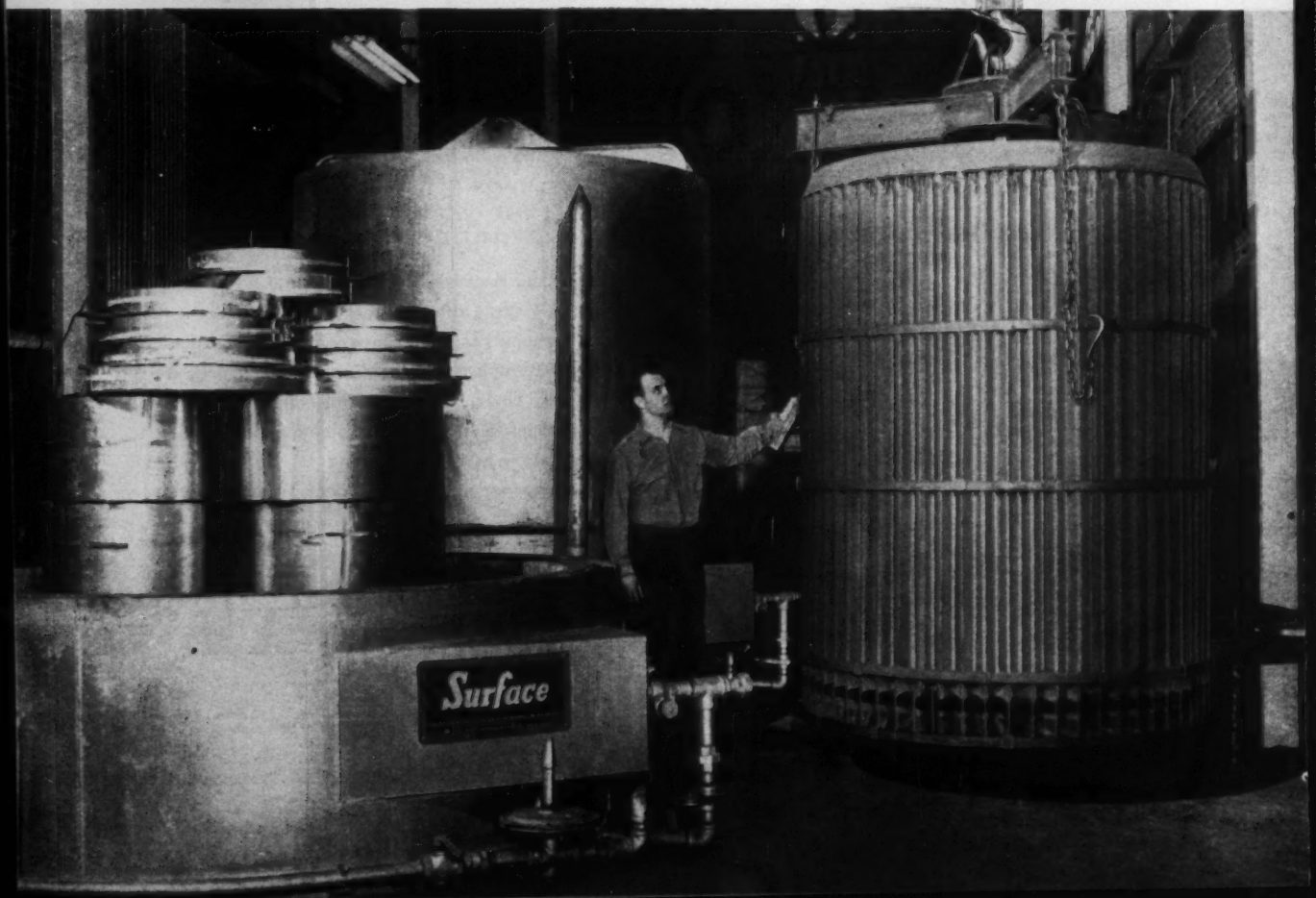

To all metals Norton adds the first "Touch of Gold"

The term "precision-snagging" has yet to be invented – and the delicate touch is not a cleaning room technique. But snagging, the roughest, toughest, most basic type of grinding does benefit considerably by the "Touch of Gold" — built into all Norton grinding wheels to improve product quality and cut production costs.

Your operators, working on machines of any type or size, will like the easy, fast-cutting action of Norton snagging wheels. And *you'll* like the way they grind off more metal per dollar and turn out better work, bringing the true "Touch of Gold" to your production. See your Norton Man or your Norton distributor about test runs to determine exactly the wheels you need for best results on any metal. NORTON COMPANY, General Offices, Worcester 6, Mass.

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75 years of . . . Making better products . . . to make your products better

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15 years engineering and millions of dollars invested* to perfect the world's finest brake... today's PACIFIC HYDRAULIC PRESS BRAKE

Over 9 out of every 10 hydraulic press brakes in operation today are PACIFIC providing...

- More dependability
- Freedom of maintenance and leakage
- Simpler electric controls
- Simpler hydraulic control
- More accuracy in level control
- More accuracy in air bending
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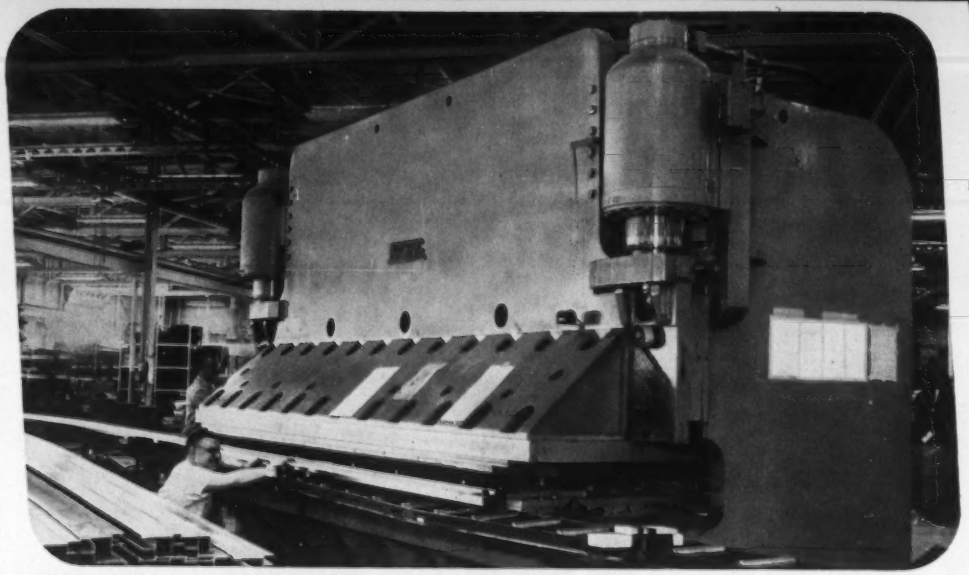
- Greater visability
- More rigidity in cylinder construction
- Shock-free hydraulic system suitable for punching



672 HOLES PUNCHED IN A SINGLE HIT! Unique upper ram guides and extra rigidity of platens of PACIFIC hydraulic press brake enable the punching of 672 holes in a single hit over a 45" wide by 14 ft. long side panel at Brown Trailer Division, Michigan City, Indiana. This rigidity permits 40 ft. long rub rails to be punched progressively with 70 holes on 2" centers over 12 ft. length on the front of the die as shown in the above photo. Cushioned hydraulic breakthrough softens the punching action on the dies to greatly increase individual punch life and eliminate costly downtime from periodic die replacement of 672 separate dies.

*THIS INVESTMENT ENABLED PACIFIC TO INTRODUCE:

- Tape control to synchronize cylinders within .003" (1947)
- Cushioned punching (1949)
- Precision depth control to repeat accuracy within .001" (1951)
- Manual turret stroke controls for progressive bending (1952)
- Selective anti-whip speeds to eliminate reverse bends (1952)
- Tandem operation of press brakes for forming pieces 40 ft. or longer (1953)
- Tonnage control to protect light dies in heavy press (1953)
- Multiple hydraulic cushion cylinders for deep drawing (1954)
- Overhead integral power unit for increased accuracy (1955)
- Cylinder ram guides for increased rigidity (1956)
- Shearing attachment for shearing heavy plate on press brake (1958)
- Pipeless stacking of valves to eliminate pipe breakage and leakage (1959)
- Shockless hydraulic valving to eliminate cause of leakage (1959)

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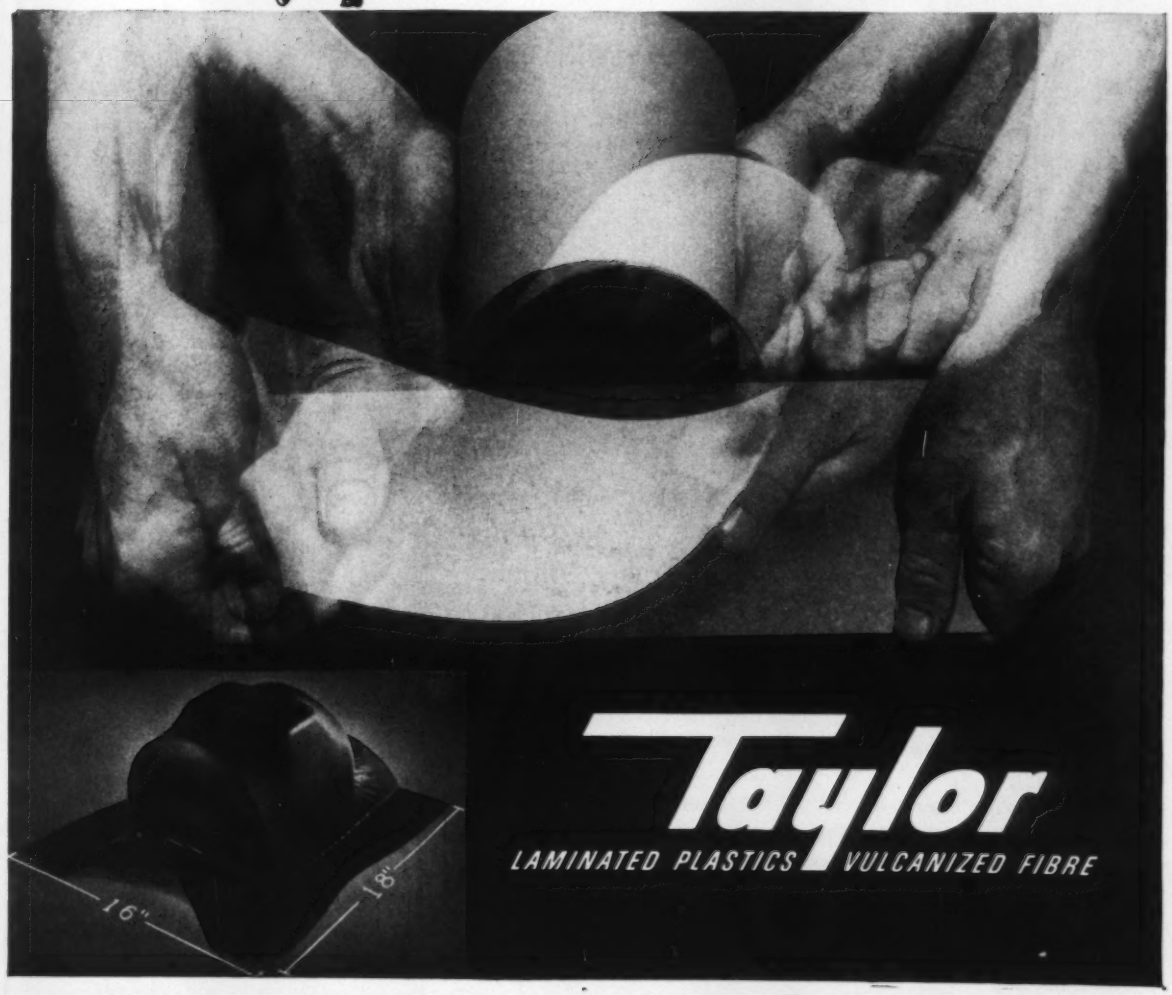
New "Taylorite"® is a veritable workhorse

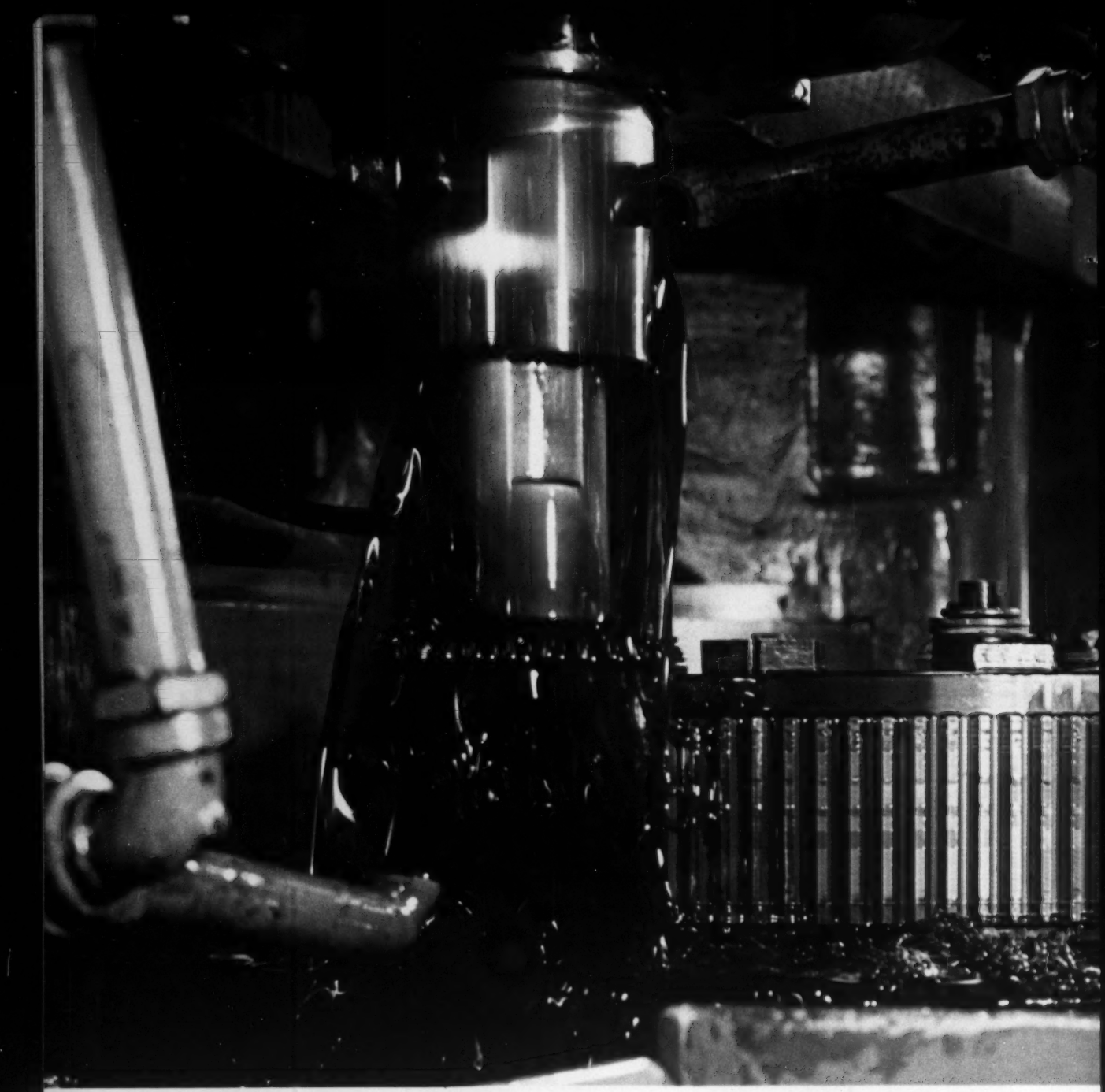
Improved Vulcanized Fibre has the formability and strength to be deep drawn into many intricate shapes

There has been a big change in Taylor Vulcanized Fibre, including the name. New processing equipment and atmosphere-controlled storage facilities have enabled us to make major advances in overall reliability—including uniformity from lot to lot—at no increase in cost to you. Among the improvements are better formability and capacity to be deep drawn. These, combined with greater tensile strength, flexural strength and dielectric strength, make new Taylorite an ideal material for 1001 industrial applications.

Samples are available. Test them for yourself. Put them under tension, flex them, compress them, form them. You will find that new Taylorite survives your severest tests. And remember, Taylor offers complete design and engineering service. Write for Data Sheet 2-0 and samples. Taylor Fibre Co., Norristown 52, Pa.

TAYLORITE vulcanized fibre meets deep draw requirements. Material used was .060 in. thick sheet of commercial grade. Forming of the welder's helmet was performed under normal production conditions.





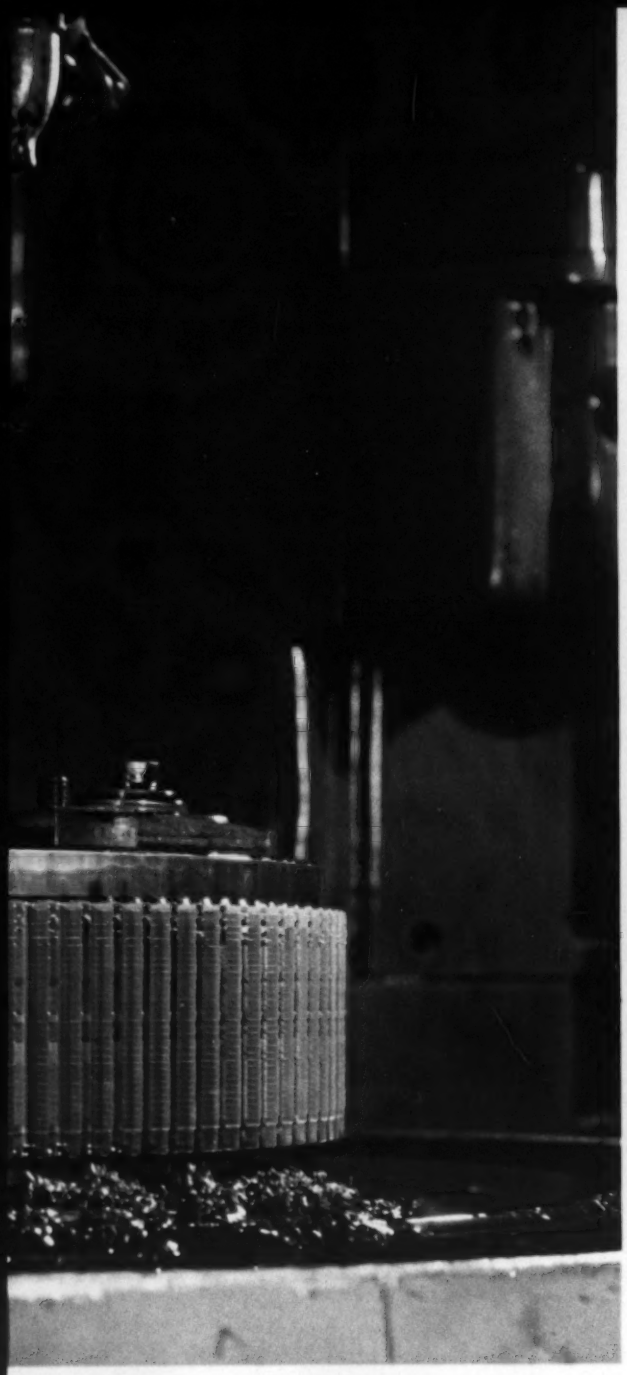
Switch to Gulfcut® oil doubles tool life for

GULF MAKES THINGS

Gang-cutting 120 teeth in stacks of 50 clutch discs made of SAE 1035 steel, .090-in. thick, to tolerances of .0033" at relatively high feeds and speeds is rough on cutting tools. But Gulfcut 21C oil makes it just half as rough at American Brakeblok Division of American Brake Shoe Company, Cleveland, Ohio.

Says Edward Salamon, Product Engineer, "As the cutting tool on the Fellows Gear Shaper enters each disc, there is an impact, generating additional heat and increasing the tendency for the tool to chip. With the machine making 86 strokes a minute tool life used to be rather short. Since changing our cutting oil to Gulfcut 21C we've achieved two benefits: we've doubled our tool life, and we've rid the operation of the very unpleasant odor of the previous oil."

"The substantial increase in tool life and over-all oper-



Wally Pavlak, Foreman, left, shows Thomas F. Irving, Gulf Sales Engineer, that tolerances of .0033" have been maintained with help of Gulfcut 21C.

Changing to Gulfcut 21C has doubled tool life in this Fellows Gear Shaper, here cutting a stack of 50 clutch discs, each .090-in. thick.

American Brakeblok . . .
RUN BETTER!

ating efficiency," says Mr. Salamon, "has shown us that we don't need to be cutting oil specialists. We just call in a Gulf Engineer to provide the answers."

See for yourself how Gulf makes things run better! A call to your nearest Gulf office will bring a Gulf Sales Engineer with practical help. Meanwhile, send for your free copy of "Metal Machining with Cutting Fluids," the new 116-page handbook on their selection and use.

GULF OIL CORPORATION
Dept. DM, Gulf Building
Pittsburgh 30, Pa.

GULF

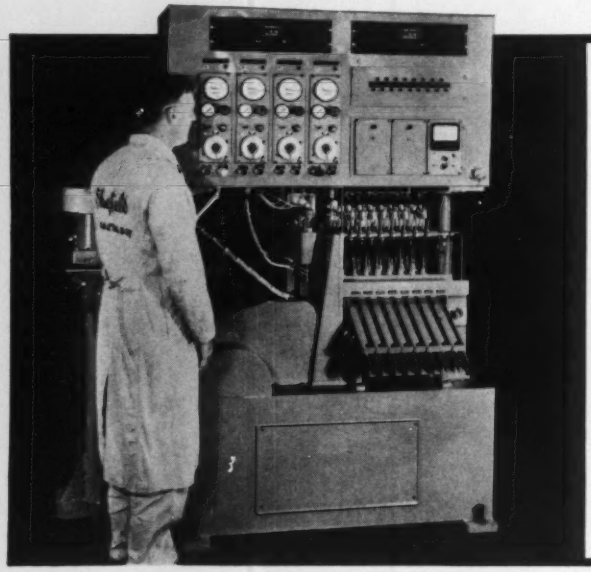
SP 9821

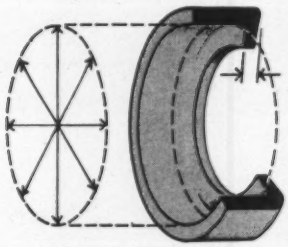
A **Sheffield sorter*** sorts 2000 rings an hour

2000 rings an hour a **Sheffield sorter*** sorts.

If a **Sheffield sorter*** sorts 2000 rings an hour

Where are the 2000 rings the **Sheffield sorter*** sorts?





*This Sheffield automatic gaging, classifying and segregating machine inspects up to 2,000 rings an hour for the Western Electric Company. It simultaneously measures inside diameter and flange thickness, classifies rings into 15 sizes plus out of tolerance, and rejects each size in its chute. Its speed and accuracy have resulted in appreciable manufacturing savings.

One of them is in your telephone.

Pick it up and call SHEFFIELD for further information on automatic gaging and assembly machines. CL 4-5377, Ext. 211, 212, 213.

The **SHEFFIELD** Corporation Dayton 1, Ohio

A subsidiary of the Bendix Corporation

Gages, Measuring Instruments, Automatic Gaging & Assembly Systems • Machine Tools • Contract Mfg.

Tall in the Saddle

Few men enjoyed the distinction of being "tall in the saddle." To be fast on the draw, to ride and work better than most men, to radiate confidence in everything—these are some of the things a man had to be before he won the compliment. It had to be *earned*.

Much of this applies to wire rope. Like Roebling Royal Blue Wire Rope for a "tall-in-the-saddle" example. Wherever it goes to work it makes a lasting impression. It works harder and better than other wire ropes—it radiates confidence on the job.

Royal Blue's resistance to the ills that wire rope is heir to: impact, crushing, shock, abrasion—is truly outstanding. It is the toughest wire rope you can use for a long time to come.

We have a wealth of Royal Blue data in the forms of literature, workaday applications throughout industry and hard facts on how this "happy breed" can keep a lot of your wire rope money where it belongs—in your pocket. If you will write Wire Rope, John A. Roebling's Sons, Trenton 2, New Jersey, we'll tell you all.

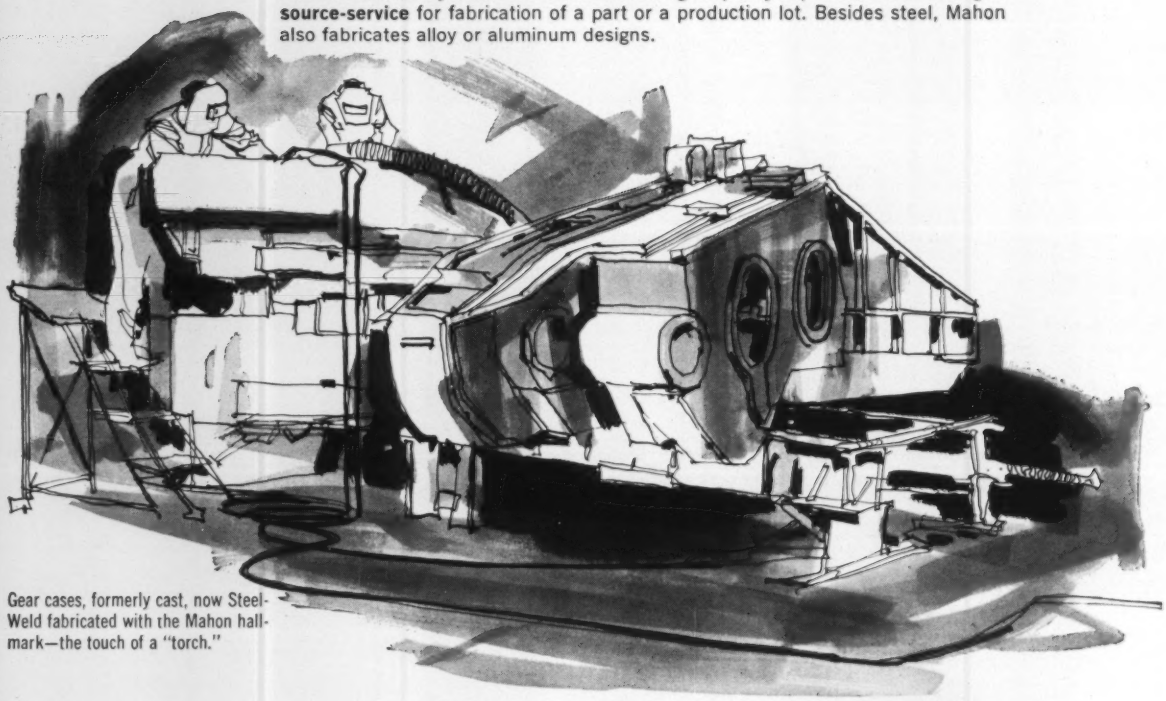
ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

MEN WHO KNOW
FACILITIES, CAPACITY
AND **EXPERIENCE,** BUY...

"fabrication by Mahon"

Unmatched experience . . . from fabricating hundreds of thousands of parts of all types, both mechanical and structural . . . has sharpened old-time craftsmanship into a modern production art, uniquely applied by Mahon's Steel-Weld Division. No matter what kind of fabrication—welding, machining, or assembling—your parts might require, Mahon's experience is yours at **no extra cost.** This depth of experience is backed by extensive facilities and large capacity to provide the best **single-source-service** for fabrication of a part or a production lot. Besides steel, Mahon also fabricates alloy or aluminum designs.



Gear cases, formerly cast, now Steel-Weld fabricated with the Mahon hallmark—the touch of a "torch."

Non-destructive radiographic inspection insures highest quality work by Mahon—Master of Metals.

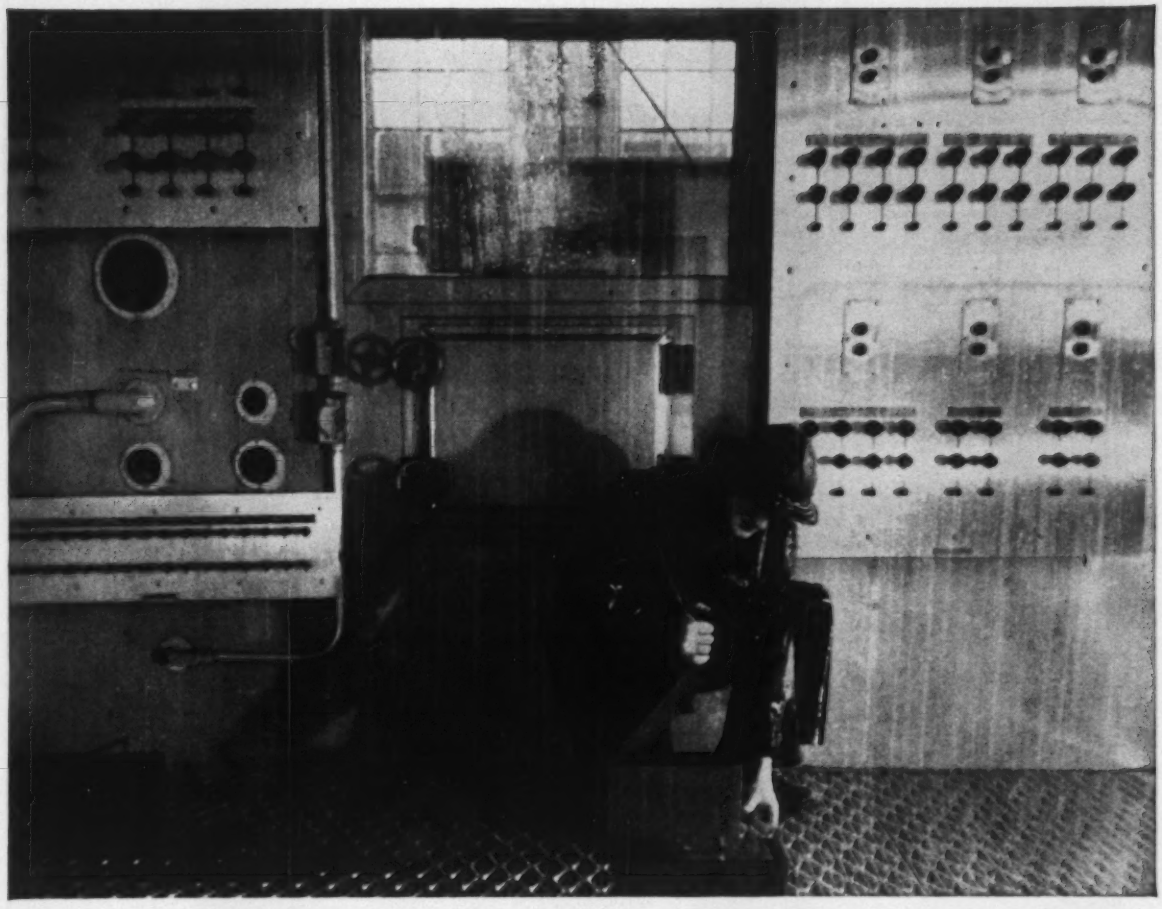
WRITE TODAY FOR NEW STEEL-WELD LITERATURE . . . OR, FOR ON-THE-SPOT HELP, DISCUSS YOUR DESIGN REQUIREMENTS WITH A MAHON FABRICATION ENGINEER

THE R. C. MAHON COMPANY · DETROIT 34, MICHIGAN

Manufacturing Plants—Detroit, Michigan and Torrance, California

Sales-Engineering Offices: Detroit, Chicago, New York, San Francisco and Torrance

MAHON



In test chambers of the U. S. Army...

Nickel meets the torture of man-made weather

Sometimes it's as steaming as the Malayan jungle...sometimes as hot as the Sahara...and then an arctic storm blows in. Nowhere in the world does Nature brew up such changeable weather as men do in Philadelphia.

Here in weather chambers of the U.S. Army, military equipment undergoes weather conditions that make Mother Nature seem like a gentle old soul by comparison.

If you think this is tough on the equipment, how about the chambers themselves. The equipment is in and out, but the chamber has to take it for test after test. That's why the designers line them with a Nickel Stainless Steel—Type 18-8. Nickel Stainless Steel *can* take it. It's corrosion resisting in the wettest atmosphere. It withstands sub-zero temperatures. The shocks of see-sawing "weather" conditions harm it not at all.

Still another Nickel alloy—a nickel-chromium type — lines heat test units where temperatures get up over 1200°F. Another nickel-chromium alloy is used for the glowing heating elements.

Make your own forecast of what a metal must face—Nickel and its alloys can help you meet the challenge. Is it ability to meet stress, fatigue, heat or cold, corrosive atmospheres or a combination of these? We may be able to help you find the answer in Nickel. Just write.

Weather chambers like this one designed by Tenney Engineering, Inc., Union, N. J., are lined with Nickel Stainless Steel. Notable installations include those at the U. S. Army's Frankford Arsenal, and Sperry Gyroscope Company, Long Island, N. Y.

The International Nickel Company, Inc. INCO **67 Wall Street · New York 5, N. Y.**

INCO NICKEL

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

Three Reasons General Electric D-c Drives are Best for

1. Costly Maintenance Shutdowns Reduced

D-c Main Drives

In metal-rolling mills—where minutes of downtime are measured in thousands of dollars—fast, simplified maintenance of main drive motors is critical.

The revolutionary "TOP-FORWARD" twin-drive shown above exemplifies General Electric's continuing emphasis on better design for ease of maintenance. Shaft extension of the rear motor passes *beneath* the forward motor instead of directly over as in conventional designs. This unique drive arrangement allows clear access by overhead crane to all bearings, air-shields and other components of *both motors*.

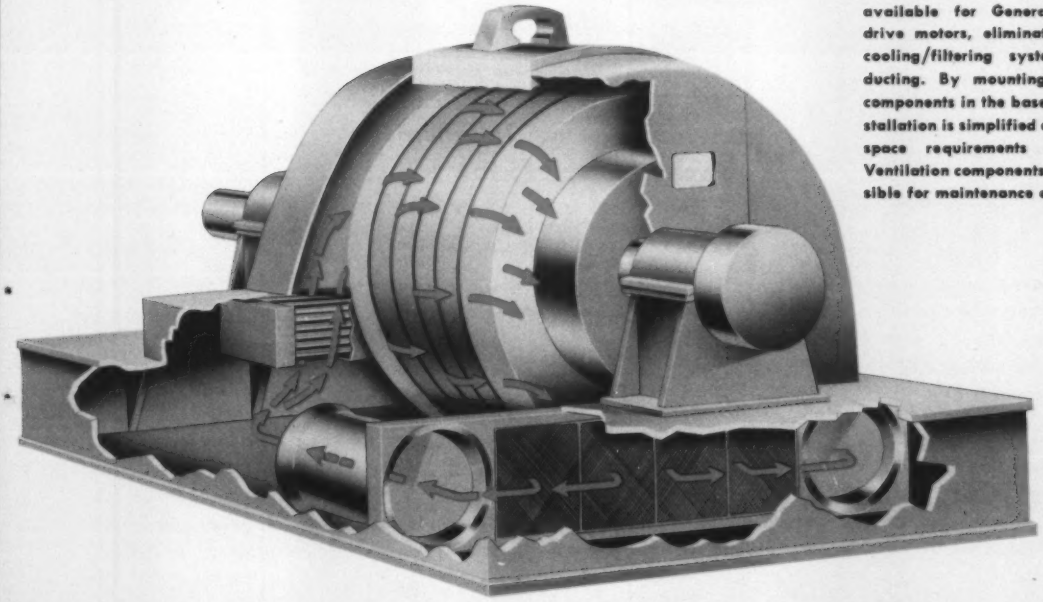
Shorter over-all length of drive substantially reduces space required and provides cost savings in foundation construction. Improved Class B Insulation system for armatures and fields, utilizing proven resins and compounds, provides greater resistance to heat, moisture and dirt.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Automated Production Systems

by New Advances in D-c Drive Design

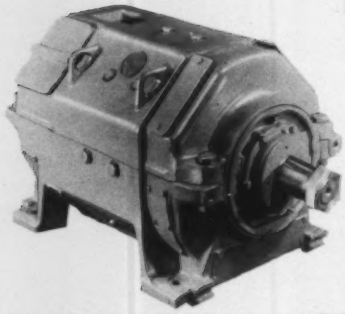


INTEGRAL VENTILATION SYSTEM, **available for General Electric main drive motors, eliminates separate air-cooling/filtering system and related ducting. By mounting all ventilation components in the base of the drive, installation is simplified and supplemental space requirements are eliminated. Ventilation components are easily accessible for maintenance and inspection.**

Three Reasons General Electric D-c Drives are Best for

2. G-E Drives Are Durable and Reliable—

D-c Auxiliary



GENERAL ELECTRIC'S MD-600 ARMORED MOTOR is built to withstand severe shocks, give maximum reliability. Class H insulation provides superior protection—permits greater work capacity.

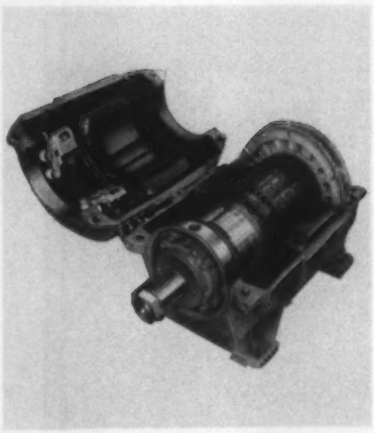
Designed to exceed the requirements of the most advanced continuous processing systems, General Electric MD-600 series armored mill motors are built to withstand regular exposure to hot scale, steam and corrosive sprays. Improved high temperature insulations have appreciably lengthened motor life.

Designed to meet or exceed AISE standards in all respects, General Electric's armored motor offers unmatched flexibility. This motor can be adapted to fit any of five different ventilation requirements simply by adding or removing standard covers. No other modifications are necessary.

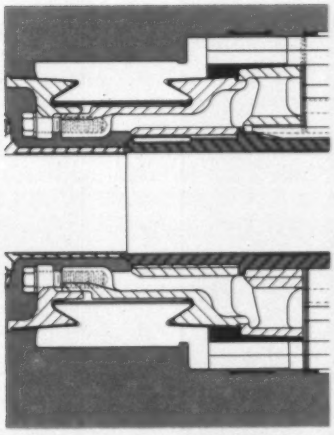
Progress Is Our Most Important Product

GENERAL ELECTRIC

Meet Demands of Continuous Processing



DESIGNED FOR EASY ACCESS, top half of General Electric MD-600 motor frame swings open nearly 180° to permit fast armature removal. Positioning keys in frame heads facilitate armature alignment.

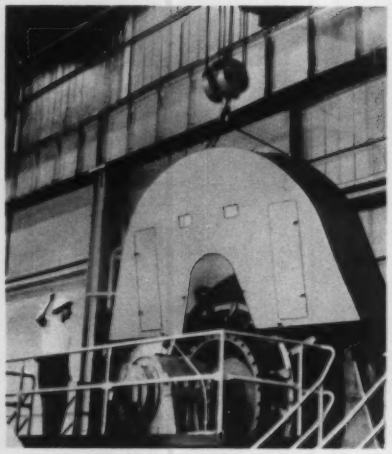


DESIGNED FOR EASE OF MAINTENANCE, the armature on General Electric armored motors is assembled on a steel spider so the shaft can be pressed out without disturbing commutator or windings.

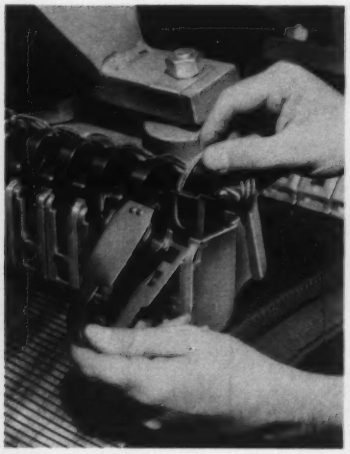
BUILT TO DRIVE HEAVIER LOADS—accelerate, start, stop and reverse faster—MD-600 motors meet toughest demands of automated systems. Integral feet on the endshields allow the armature to stand alone when removed from frame.

Three Reasons General Electric D-c Drives are Best for

3. G-E Drives Give You New Competitive



NEW QUICK-REMOVABLE COVERS use no bolts, permit easy access. Tapered guide pins, attached to "TOP-FORWARD" d-c main drive motor frame, accurately position covers on base and frame. Removal and replacement time is reduced to a minimum.



CONSTANT-PRESSURE BRUSH-HOLDERS eliminate all pressure adjustments, give optimum contact at all times. General Electric brush-holder design permits observation of brush wear. Brush can be replaced in seconds.

DISC-LUBRICATED BEARINGS provide positive oiling during all operating conditions. Self-aligning, cast-steel, babbitt-lined bearings can be removed without disconnecting oil piping—maintenance is simplified.

Automated Production Systems

Advantages to Meet the Challenge of the 60's

Higher processing speeds, tighter production schedules and better product quality are requisites of industrial growth in the coming decade. As continuous processing and automation techniques spread throughout industry, rapid maintenance of basic equipment becomes an increasingly important competitive advantage.

General Electric's simplified-maintenance drive design gives you this advantage plus the high thermal and mechanical limits and improved commutation demanded of automated processes.

Let your G-E Sales Engineer show you how easily new d-c main and auxiliary drives can fit into your modernization plans, improve operating efficiency and help you meet the challenge of the '60's. For descriptive information on d-c motors for heavy industry, write Section 772–9, General Electric Co., Schenectady 5, N. Y. *Large Motor & Generator Dept., Schenectady, N. Y./Direct Current Motor & Generator Dept., Erie, Pennsylvania.*

Progress Is Our Most Important Product

GENERAL ELECTRIC

D-c Main & Aux. Drives

NO. 5 OF A SERIES

"How to Design Welded Aluminum Structures"

Alcoa Verifies More Liberal Strengths in Design of Welded Aluminum Beams

Mr. Harry N. Hill, *Engineering Design Division Chief, Alcoa Research Laboratories, Aluminum Company of America, reports findings presented at the 1959 annual meeting of the American Society of Civil Engineers.*

The useful strength of a metal beam is seldom determined by reference to its tensile strength. Rather, a beam's load-carrying capacity is judged by its resistance to permanent deformation. Yield strength, therefore, is the common basis for beam design.

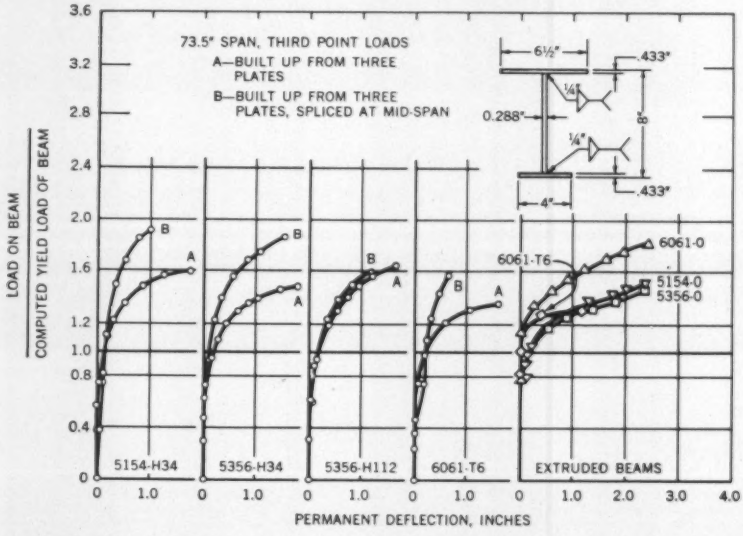
Yield strength values for welded aluminum alloy beams can be computed by applying the concepts of "reduced-strength zone" and "10-in. gage length yield strength" which were discussed in the first two articles of this series. The same procedure outlined in our third article for tension members can be utilized.

Total flange area for this computation is considered as the flange itself, plus one-third the adjacent web area between the flange and the neutral axis. Yield load of the beam is that which will produce a maximum bending stress equal to the yield strength of the tension or compression flange.

The validity of this design technique is demonstrated in the chart at right. Test pieces of aluminum alloy plates were welded to form an I cross section as indicated in the sketch. Both cold-worked and heat-treated alloys are included. "B" specimens were cut at mid-span and butt welded.

Permanent deflection at mid-span was measured with increasing loads. To compare actual yielding with calculated behavior, the applied loads are expressed as a ratio of the computed yield load.

Our tests indicate a high reliability of the computed yield load concept. Note that no significant permanent deflection occurred until the ratio of applied load to computed yield load reached 1.0.



COMPUTED AND ACTUAL YIELDING OF WELDED ALUMINUM ALLOY BEAMS

Further verification of this design rule was gained in tests of extruded beams with the same section as the welded beams. At the extreme right of the chart are similar plots for these beams. Yield loads were computed from tensile yield strengths. Note the similarity in yielding behavior between the welded and extruded beams.

Strength of long slender beams is sometimes limited by sidewise bending and twisting. Here the compression flange buckles much the same as a column. Such failure can be computed by the designer with the "equivalent slenderness ratio" method described in the *Alcoa Structural Handbook*. This technique relates the beam strength directly to design curves for columns. The column curves for welded aluminum alloy beams are constructed as discussed in article No. 4 of this series.

Previous articles in this series have featured reduced-strength zone, 10-in. gage length yield strength, strength of welded members in tension, strength of welded members in compression. Subsequent articles will deal with fillet welds and additional design data.

For top-quality aluminum welding products such as consumable electrodes, welding and brazing rods and fluxes, and solder and soldering fluxes, contact your nearest Alcoa sales office. For more complete information on "Designing Welded Aluminum Structures," write Aluminum Company of America, 1761-G Alcoa Building, Pittsburgh 19, Pa.

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and "Alcoa Theatre" alternate Mondays, NBC-TV

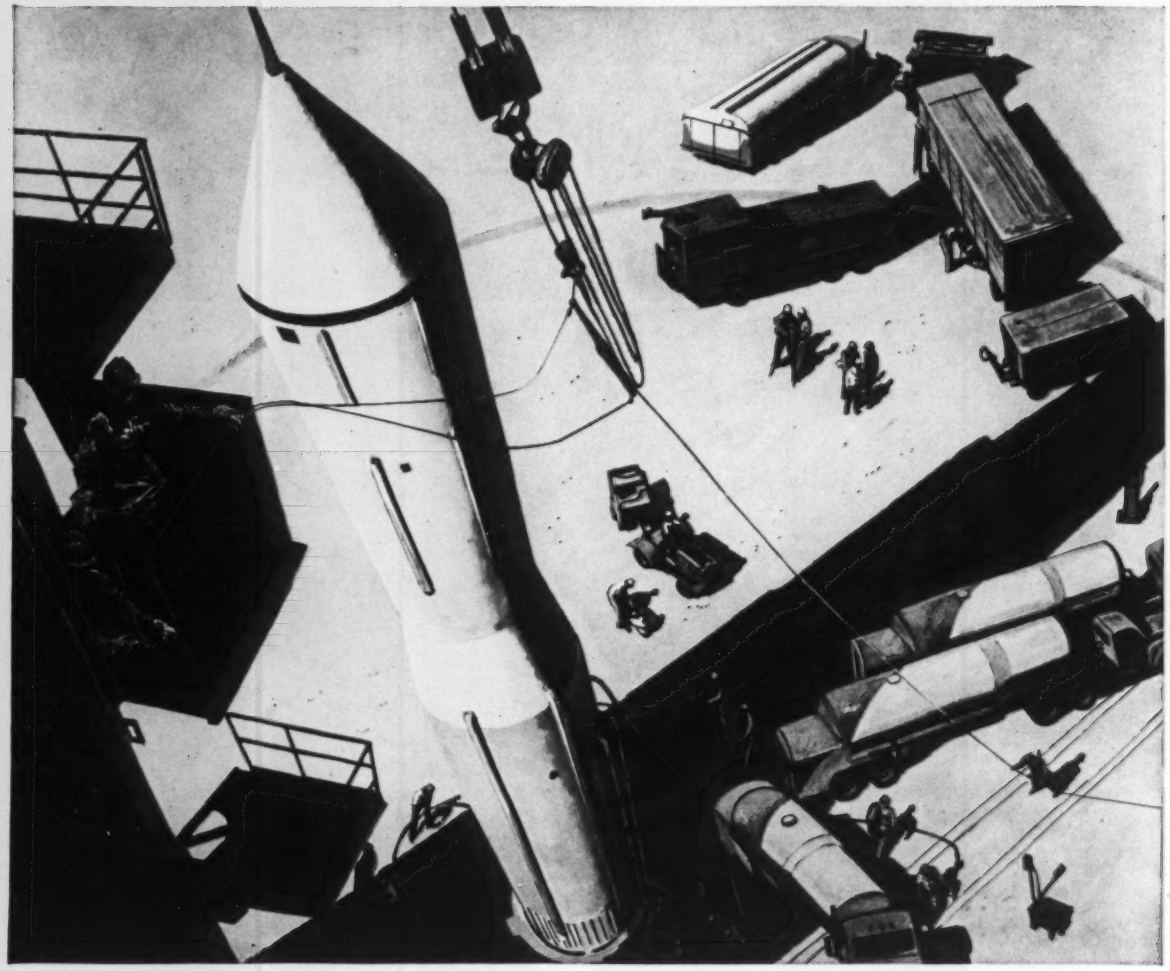
ALCOA ALUMINUM

WELDING MATERIALS

BLAW-KNOX

Blaw-Knox designs and builds a full range of continuous, semi-continuous and single stand reversing hot strip mills. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations and auxiliary equipment for ferrous and non-ferrous metals, sheet and strip processing equipment, electrolytic tinning, annealing, and galvanizing lines, seamless pipe and tube mills, draw benches, and cold draw equipment, Blaw-Knox Medart cold finishing equipment, iron, alloy iron and steel rolls, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat and corrosion resisting alloy castings. Blaw-Knox Company, Foundry and Mill Machinery Division, Blaw-Knox Building, 300 Sixth Ave., Pittsburgh 22, Pa.

56-inch semi-continuous hot strip mill.

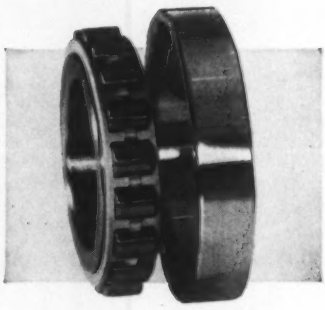


SEARING HEAT, FRIGID COLD TORTURE MISSILE BEARINGS

When a rocket fires, each component must *be* right, *work* right, the *first* time—and operating conditions are extreme! For example, liquid oxygen sends bearing temperatures plunging to hundreds of degrees below zero . . . while engine heat roasts bearings at a near-thousand degrees. Elsewhere, incredibly precise systems move surely on bearings with millionths-of-an-inch tolerances. In these critical applications you'll find Bower Roller Bearings!

On the ground, Bower Roller Bearings keep trucks, equipment and gantries rolling under the heavy loads essential to the missile's launching.

Bower, a major supplier of bearings for missiles and aircraft, also serves many other industries—automotive, construction machinery, machine tool and farm equipment, to name a few. You'll find bearings for most every field in Bower's full line of tapered, cylindrical and journal roller bearings.



BOWER ROLLER BEARINGS

Bower Roller Bearing Division • Federal-Mogul-Bower Bearings, Inc. • Detroit 14, Michigan

RELIABILITY:

Reason enough to buy LeBlond

See LeBlond Booth 810 at the Machine Tool Exposition in Chicago, September 6—16. MMT-PE

Valuable as five fingers on a hand, these five great LeBlond lathes run round the clock, year in, year out, at the Warren, Ohio, shops of Wean Manufacturing Co. Wean has six LeBlonds in all, including the five in the picture, all purchased in the last five years.

The operations they perform are typically job-shop. Lots are small—five parts alike are a big run; materials may vary from hardened steel to copper. Fat mill rolls, long whippy spindles, sturdy stepped shafts—the rugged LeBlonds take them as they come and turn them quickly and accurately, regular as clockwork.

Much of Wean's output goes into steel mill equipment that can be relied on to hold up under the most exacting requirements—the same steadfast degree of reliability that LeBlond lathe customers expect, and get.

RELIABILITY is a good reason to buy a lathe. It is reason enough to buy LeBlond.

THE R. K. LeBLOND MACHINE TOOL COMPANY
Cincinnati 8, Ohio

LeBLOND *of Cincinnati*

integrated CRUCIBLE steel service

Crucible inside account salesmen (1) simplify ordering and expedite deliveries of the steels you need, (2) arrange for handling extra services, (3) supply you with basic steel and metalworking data.

staffs 34 local warehouses with specialized personnel to solve your specialty steel problems

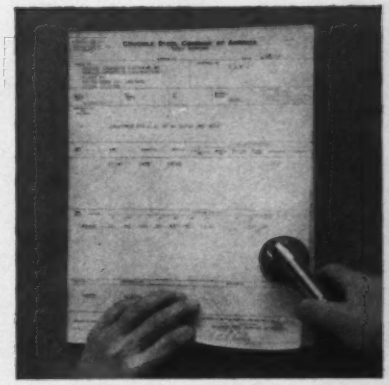
"We frequently rely on Crucible warehouse people," says one of our good customers. "We've found they can sometimes show us more economical steels, sizes and methods than those we're using. Furthermore, they give us valuable help with steels we're using for the first time."

This steel buyer, like thousands of others, believes in getting services with the steels he buys. Here's what he gets:

Crucible inside account salesmen help him simplify ordering, speed up his deliveries. They can efficiently arrange for extra services, such as forging, slitting, grinding and polishing, because of their special training at Crucible mills.

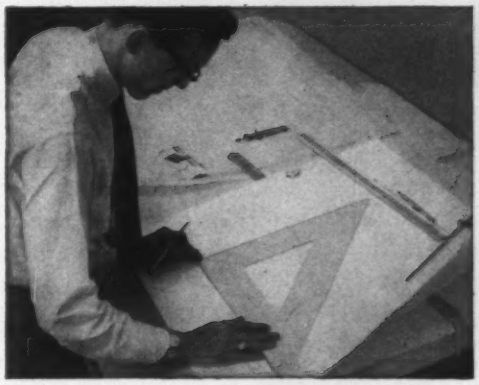
Crucible sales-service engineers give their production and toolroom people valuable metalworking assistance. They'll recommend machining speeds and feeds, quenching temperatures, the best forming and joining methods.

Behind these specialists are the resources of Crucible's entire, integrated operation – from mining the ore to steelmaking to warehouse delivery to you. Why not take advantage of these services each time you order specialty steels? They're available through every Crucible warehouse. *Crucible Steel Company of America, Dept. PG06, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*



Need certified test reports for government work? Warehouses can supply the steels and notarized reports of analyses.

Trained, experienced sales-service engineers can help your engineers use steels that are new to you.



This is the easiest way to arrange for forging, flame-cutting — have the warehouse accommodations service do it for you.

STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

TOOL STEELS–Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS–Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEELS – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS – Crucible Max-el® rounds, hexagons, plates and brake die steel

ALLOY STEELS – Bars, billets, strip and sheet

COLD ROLLED CARBON SPRING STEELS

DRILL STEELS – Hollow and solid drill steels

ALUMINUM EXTRUSION DIE STEELS

HOLLOW TOOL STEEL

HARD FACING ROD

PLASTIC MOLD STEELS

PERMANENT MAGNETS

– and many others

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From first heat to heat treat . . .

LOFTUS

designs and builds them better

International Harvester Corp., West Pullman Works

COVER TYPE ANNEALING FURNACES

DIRECT-FIRED SINGLE-STACK

Generally Recommended
for
Greater Productivity per Investment Dollar
and
Flexibility with Economy

When warranted by special conditions, radiant tube or multiple stack construction are also available.

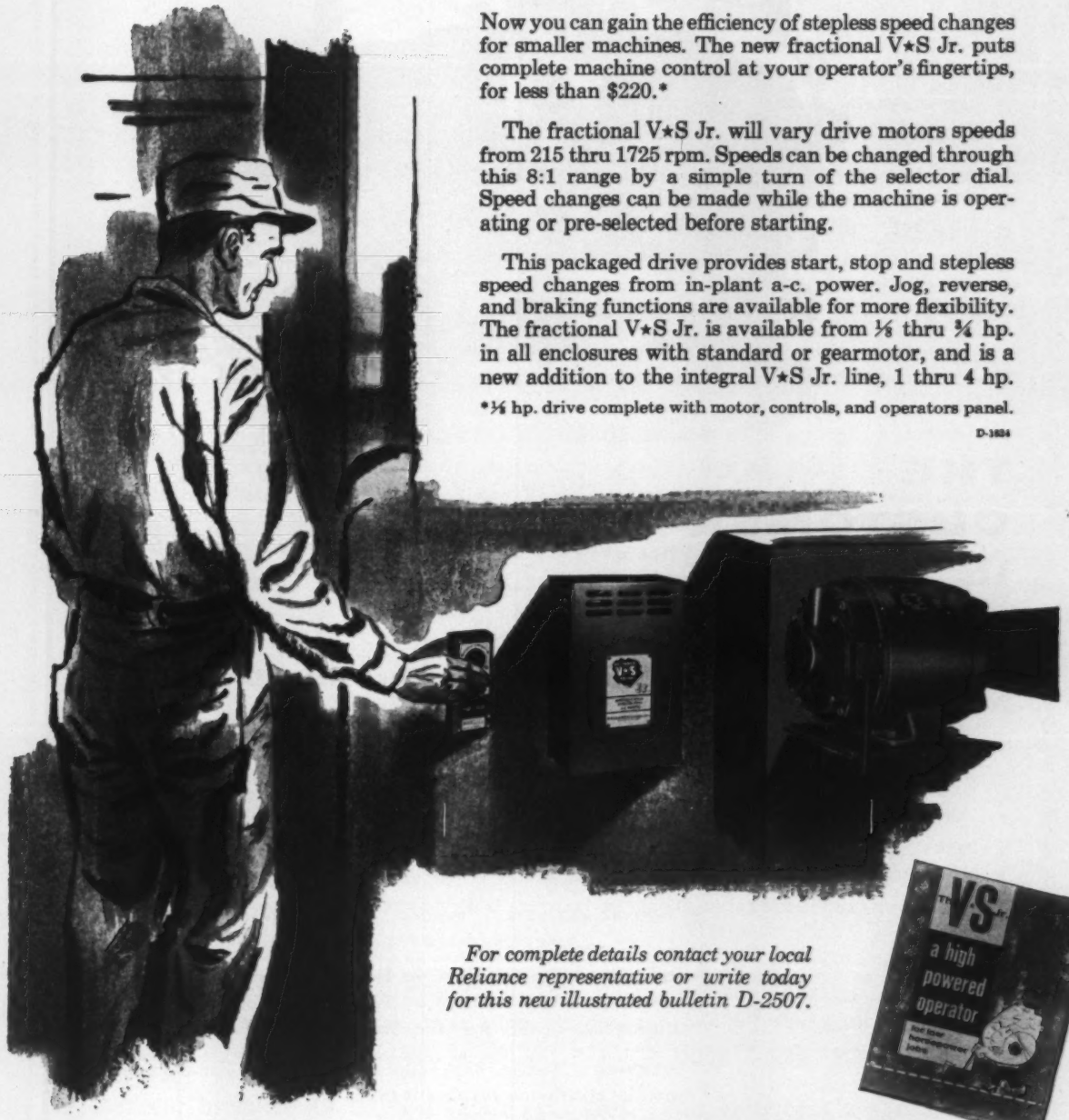
LOFTUS

Engineering Corporation

1 Gateway Center, Pittsburgh, Pa.

57.12.4A

INTRODUCING AN ALL ELECTRIC, VARIABLE SPEED DRIVE FOR UNDER $220.* THE FRACTIONAL hp. V★S Jr.



Now you can gain the efficiency of stepless speed changes for smaller machines. The new fractional V★S Jr. puts complete machine control at your operator's fingertips, for less than $220.*

The fractional V★S Jr. will vary drive motors speeds from 215 thru 1725 rpm. Speeds can be changed through this 8:1 range by a simple turn of the selector dial. Speed changes can be made while the machine is operating or pre-selected before starting.

This packaged drive provides start, stop and stepless speed changes from in-plant a-c. power. Jog, reverse, and braking functions are available for more flexibility. The fractional V★S Jr. is available from ⅛ thru ¾ hp. in all enclosures with standard or gearmotor, and is a new addition to the integral V★S Jr. line, 1 thru 4 hp.

*½ hp. drive complete with motor, controls, and operators panel.

D-1824

For complete details contact your local Reliance representative or write today for this new illustrated bulletin D-2507.

Product of the combined resources of Reliance Electric and Engineering Company and its Master and Reeves Divisions

RELIANCE ELECTRIC AND ENGINEERING CO.

DEPT. 27-A, CLEVELAND 17, OHIO

Canadian Division: Toronto, Ontario

Sales Offices and Distributors in Principal Cities

Duty Master A-c. Motors, Master Gearmotors, Reeves Drives, V★S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.

THE CUSTOMER IS BOSS AT SEAWAY STEEL

...where small orders get BIG attention

At Seaway every order, regardless of size gets the *same* special attention and accommodative service.

The Seaway Steel operation is literally "tailor-made" to serve the customer who requires:

FLEXIBILITY... Bars and Rods of any size or shape produced to your specifications, *regardless* of *quantity*.

SPECIAL ANALYSIS • SPECIAL SURFACE FINISHES
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A BIG RISE IN CORPORATE PROFITS is reported for the first quarter of 1960 compared to the closing three months of 1959. The $49 billion annual rate of pre-tax net income was up $3 billion.

THE BOOM IN BOATING OFFERS A GROWING MARKET for metalworking. Record retail sales of $2¼ billion in boats, equipment, and accessories were made in 1959. And sales this year are expected to be about 5 pct higher. Some metalwork requirements: Wire rope stays, keels, centerboards, and in almost 4000 marinas; wrought iron cleats and fittings, cranes, and hoists.

MALLEABLE IRON FOUNDRIES EXPECT FAVORABLE MARKET TURN as their users reach satisfactory inventory levels. One of the best weathervanes for business has been the ratio of sales to inventories for durable goods makers, says the Malleable Founders Society. These sales have soared to over $15 billion a month while inventories have stabilized.

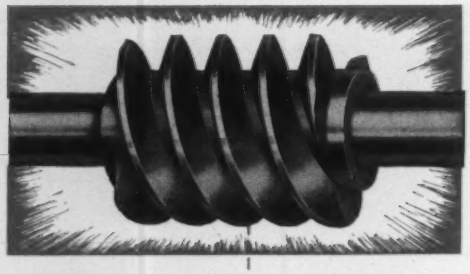
METALWORK PRODUCTS CURRENTLY SOUGHT by foreign sources range from bolt cutters to aluminum buildings. Among the items listed by the Commerce Dept. are tap and die sets for Ceylon, roller bearing axle boxes for India, and turbine pumps for Iraq.

SALES OF FULL LINE FARM EQUIPMENT MANUFACTURERS show strength. Sales (of 7 leading companies) during the six month period ended April 30 amounted to $1,307,206,000, a slight increase from $1,288,594,000 in sales made in the same period in 1959. These companies account for 65 pct of the industry's dollar volume.

NET SHIPMENTS OF ALUMINUM MILL PRODUCTS showed a 10 pct increase in May over April--272 million lb compared to 247 million lb. Aluminum pig and ingot shipments also rose in the same period, from 119 million lb to 127 million lb, a 7 pct increase.

EXPORT STRENGTH IS SHOWN BY SOME METALWORK LINES despite a 2 pct decline in general exports from April to May. Copper semi-manufactures rose from $23.6 to $36.7 million. Iron and steel plates, sheets, and strip rose from $21.8 to $32.9 million.

FOUNDRY EQUIPMENT NET ORDERS ROSE in May to 159 (1947-49—100) in the index of the Foundry Equipment Manufacturers Association. Orders averaged 122.6 during the last quarter of 1959.



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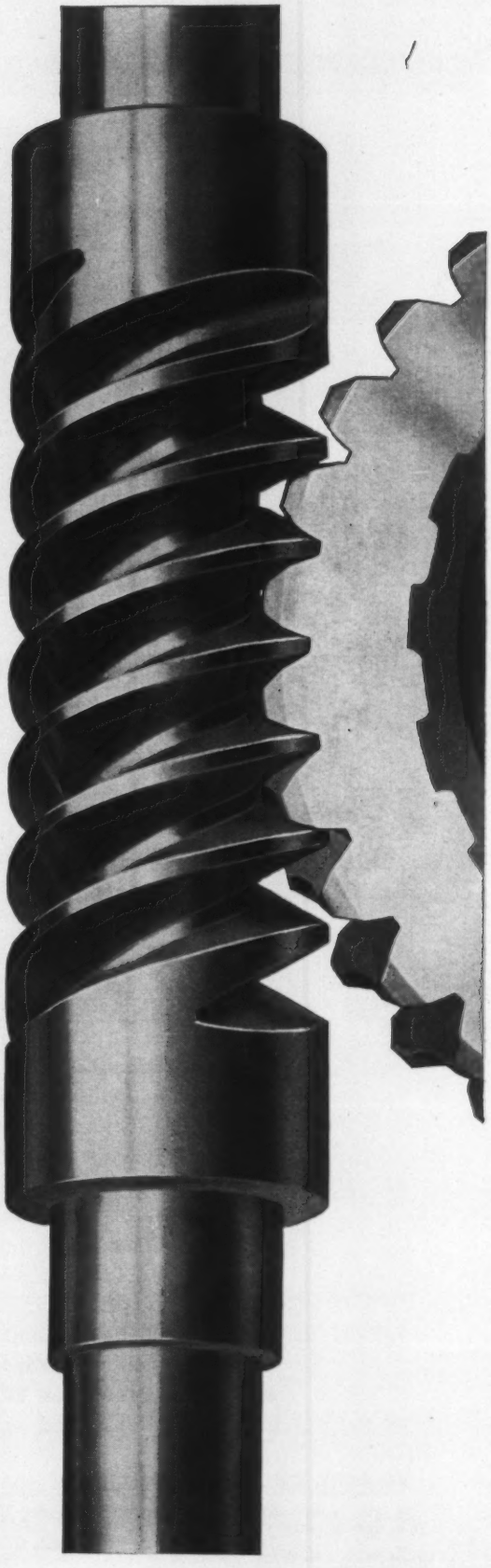


Demand for Executives Eases

But the Slowdown May Be Only Temporary

Some executive recruiters say easing in demand for some executive categories is only temporary.

But right now, the search for some types of executive talent has slowed.—By K. W. Bennett.

■ If you're shopping for executive talent, it's a good time to start looking.

The usual summer slump in top level hiring by U. S. companies is on. It's coupled with a sharp drop, during the second quarter, in demand for several types of executive talent.

The next 60 days will be a prime time to go on an executive manhunt. But the salary requirements of capable executives won't shrink.

Sharp Change — The second quarter drop in executive demand is a sharp reversal of the 1959 explosion. The second quarter saw a big decline in the number of executive openings, according to Executrend, quarterly national survey of Heidrick and Struggles, Inc., Chicago-based national executive recruiting firm. (See chart, below).

Executive job offers in second quarter '60 were 15 pct below the first quarter. Demand in the first quarter this year was 60 pct ahead of the same period in 1959 and 24 pct over fourth quarter, 1959.

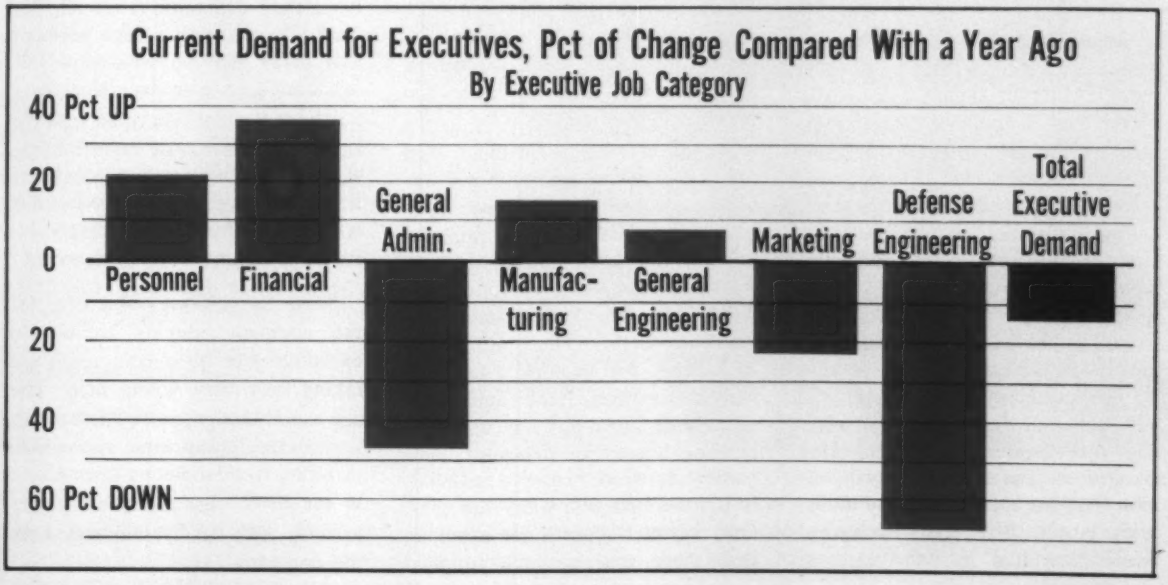
Who's Available?—If you're in the market for finance men of top level status, they're about the easiest to obtain of seven executive categories. Marketing men are next in availability, followed by personnel directors.

That's in spite of the fact that the number of job offers open to general administration execs and defense engineers, has fallen more sharply than the number of jobs seeking a man with marketing skills. These men tend to stick with their jobs.

Of all executive recruiting by U. S. business, skills most often sought are general engineering directors, or marketing directors. Over 50 pct of all second quarter job offers were seeking executives with these skills. While total executive job offers fell by 14 pct during the second quarter, demand for general executive engineers rose 9 pct. Marketing job offers fell by 22 pct. So that while fully a quarter of executive job offers are to marketing men, demand is off in relation to supply.

Salary Demands Steady — An executive recruiter warns, "It's true that demand for top level executives

How Demand for Executives Changes



How Recruiters View Situation

Despite the current slowup in executive demand, recruiters are confident the long-range outlook is for more executives.

Here's what they say:

"We expect to have a record placement year. I can't foresee any future change in executive demand except an increasing tightness. The manpower pool is still shrinking, and will continue to shrink into the 1970s."—C. R. Martin, partner, Booz, Allen & Hamilton.

"This is the first measurable downtrend in executive demand since 1958. Business appears to be in a period of indecision. It's a breathing lull in what appears to be a long-term rise in the need for executives."—Gardner Heidrick, Heidrick and Struggles, Inc.

"Our business is growing steadily. Frankly, I don't think that's merely because we're the answer to everybody's problems. I think the economy is growing at a rate faster than it is training executives to meet this growth." D. E. DeVoto, DeVoto, Somes and Co.

has fallen off, at least for the moment. But don't think it's changed salary demands by top level people who are job seeking. The current dropoff will have to continue for a much longer period before salary demands by jobhunting execs will fall. Good men are still hard to find, and they know it."

While good men are still hard to find, he admits, they are at least slightly easier to locate than they were 90 days ago, and certainly considerably more available than in 1959.

Supply and Demand — Defense engineers illustrate this point. The number of job openings for executives with a defense plant engineering background is 67 pct below the year ago period. Despite this major decline (measured in 11 cities across the nation) it is not easy to find executive talent in this category. The recruiter's point: If it's tough to find an engineering director at the moment, it's at least much less difficult than last year.

The steady uptrend in industrial research and development is soaking up research and engineering executives. The cutback in competition for these men by defense industries is the first break industrial firms have had in two years. It doesn't appear likely it will last. While it does, research executives are at least slightly easier to get.

Growing Field — Despite the second quarter drop in demand, executive hunting is a growing business. Roy Doty, Roy Doty & Associates, comments, "I believe that less executive jobs are filled by the old word-of-mouth announcement, and more companies are retaining executive recruiters."

Opinions of executive recruiters vary widely on what skills are most available. Generally they agree that top grade public relations men, advertising men, sales executives, and personnel men are easiest to locate.

Tough or Easy?—Financial men are a difficult category. Some recruiters report the toughest manpower problem is filling financial jobs. Others say financial men are the easiest to spot.

What is actually happening appears to be this: There are plenty of sources for locating financially skilled executives. Banks and public accounting firms serve as unofficial clearing houses for depositor companies who need men, and financially trained men who want new jobs. One recruiter reports, for example, that these sources have supplied him with a number of comptroller prospects. The difficulty: Screening the applicants to find those who aren't overspecialized, can fit easily into a new job locale.

Too Much Experience?—Engineering executives and research and development men are equally difficult to hire. The problem, again, is overspecialization. The American Chemical Society, the Western Society of Engineers, and other societies and trade associations maintain files of job seekers. They are often good men, but specialists in a single field of research. Because of this, executive recruiting firms often shy away from attempting to fill research director jobs.

The corporate president, or other officer, who attempts to do his own recruiting often begins to feel he's entered a plowhorse in The Kentucky Derby. Professional recruiters are specialists in the tough job of locating good men. While they shy at the use of the word "piracy", they admit that in practice that is often what they must do.

How It's Done—The professional combs name lists ranging from alumni directories to corporation annual reports. Comments one, "We like to call it research. Actually, we're even on the hunt for men who might not have given the slightest indication they want to leave their company. After all, you can't take a spring college graduate and make him an exec that fall. We want men with experience."

Another adds, "We often read the trade magazines, just namehunting. If a man has a paper published in a trade magazine or a society journal, it gives us a lead on his talents, his training, and the fact that he exists."

Some Suggestions—One clue for the company seeking to fill an executive job: Most companies are taking only very young men. The age usually sought is 24-45. Yet this is the same group most susceptible to offers from someone else. Execs in the 45-55 age group are easier to find, and usually will stay with the company.

Plasma Arc Gun Sales Are Hot

Industry Sees 1960 as Its Top Sales Year

High temperature plasma arc gun is used to cut and coat metals.

Only five years old, the gun is fast becoming a popular and necessary industrial tool.

■ A plasma arc gun now on the market, offers theoretical temperatures of 60,000°F. Plasma arc guns that operate at temperatures from 5000°F to 25,000°F are available at $9000. Five years ago, you couldn't have bought the gun at any price. It didn't exist.

Who wants it that hot? High temperature equipment is 1960's surprise seller. There are at least 200 plasma arc generators (or guns) already scattered over the U. S. Manufacturers of the equipment say 1960 will be their biggest year yet.

Even More Heat — Allis-Chalmers, though it doesn't build plasma arc guns, has developed an accelerator. The unit will make an existing plasma arc even hotter, or prevent electrode breakdown in existing guns.

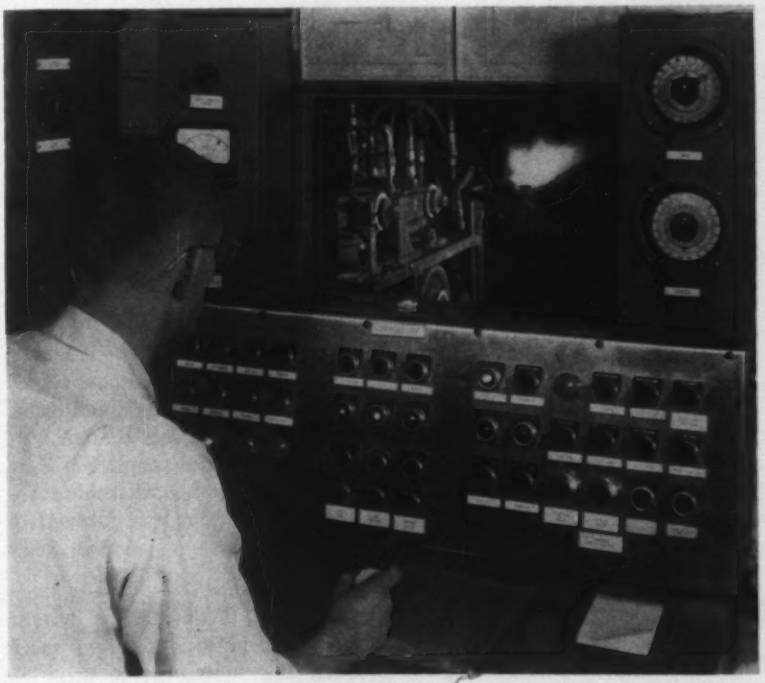
Thus far, four manufacturers have had this unique field pretty much to themselves. Plasmadyne Corp., Santa Ana, Calif.; Thermal Dynamics Corp., Lebanon, N. H.; and Metallizing Engineering Co., Inc., Long Island, N. Y., manufacture guns for sale. Linde Company, Division of Union Carbide, builds its own guns and uses them for coating refractory metals on parts supplied by other manufacturers, on a job coating basis.

More Coming—Other U. S. corporations have built their own plasma arc units. One source believes that at least 12 firms will begin manufacturing plasma arc guns for sale in the next year. Names most frequently mentioned as new entrants include Westinghouse Corp., Avco Corp., Allis-Chalmers, and General Electric Co. All four are familiar with plasma arc equipment, and all four produce components that would fit into a plasma arc generating system.

What's it for? High temperature plasma (an inert gas super heated by an electric arc) is used to cut stone, coat refractory materials on base metals, hard surface extrusion dies, and even to cut metals like steel, copper, and aluminum. Most manufacturers have never had access to these kind of temperatures before, and are still finding applications. One plasma gun producer says, "We never find all the uses. They buy the gun and hide it somewhere and I suppose they've got some kind of secret process they use it for."

Major Use — Most widespread use at present is coating metals with a refractory metal. A plasma arc will melt any substance known, including hafnium carbide which melts at about 7000°F. Powdered coating material is fed into the gun and blasted onto the workpiece by the rush of an inert gas, argon, nitrogen, or helium.

Commercial guns will put tantalum, palladium, platinum, molybdenum, tungsten, aluminum oxide, zirconium diboride, aluminum, nickel, chromium, boron, onto graphite, brass, steel, and even plastic.



NEW COAT: High temperature plasma arc gun coats a metallic area by the Linde Co. Flame Plating process. Precise quantities of oxygen, acetylene, and tungsten carbide powder—representing "powder and shot" are fed into the gun by a special mechanism. Gun is fired by remote control.

IN 1962, TOO? Will the steel contract in 1962 be negotiated in Washington in a replay of this 1959 scene?

Steel Labor Issues Not Settled

The present steel labor contract does not settle the underlying issues in steel labor.

The industry hopes a giant communications program will pave the way to a settlement in 1962.—By Tom Campbell.

■ Burning issues were never settled when the steel labor contract was signed last January. The United Steelworkers and the steel industry are miles apart six months after the new agreement.

Right now, the union is puzzled by speeches that have come from the steel side.

The steel side is puzzled by inability of the union to see the handwriting on the wall—that there must be changes in work rules and better productivity if the industry is to survive properly and furnish jobs for steelworkers.

The biggest surprise to the union was the prompt restatement of goals by U. S. Steel's chairman of the board Roger M. Blough shortly after the steel settlement. The same goes for the speech by R. Conrad Cooper, the chief negotiator, at Toronto a short while ago.

No Post Mortems—In past years, mum has been the word after a contract was signed. According to union people, the past was past: Let's get on with the contract and settle things as rapidly as possible at the working level, with no post mortems.

Apparently union and company people get along at the work level. But at the top, where the top negotiators hold sway, it looks more like "this is where I came in."

Cynical steel and union people call the present stage (until June, 1962) an armistice in the hot war. The more hopeful people call it an interim period when each side eventually will see the other's point of view.

Muddy Waters?—Officially, there is nothing muddying the waters. Steel leaders look off into space when the subject of a strike in 1962 is brought up. Union leaders live in hope that the atmosphere will change in time to prevent a repetition of 1959 events.

What's Coming In Labor?

This is the third part of an IRON AGE series on developments in labor relations.

Next week's part looks ahead to the upcoming negotiations of the electrical industry and the International Union of Electrical Workers.

But when you look a little deeper, the picture changes considerably.

In the first place, there is no budging from the steel industry's goal of a change in the work rules. Second, future wage increases will be resisted. If this is unsuccessful, the industry will fight on the basis of productivity increases only.

Third, the industry hopes to "reach" its employees directly with the greatest show of communications in history, without going through the union.

Separation Attempt—All union officials look on the communication

plans as an attempt to separate the workers from their union. Steel leaders deny they are trying to divorce the men from the union. They say they are trying to explain to the workers what union officials either do not see, do not understand, or will not believe.

After the Steelworkers national election in February, 1961, (which will be won by Dave McDonald) a little more light may be thrown on what the union intends to do about the industry's communications program.

It is certain it will attempt to counteract it. On the basis of union thinking, counteraction will mean a full-scale demand upon the industry for technological displacement protection.

Counter Offense — When the union finally believes that Mr. Blough, Mr. Cooper and others mean what they say, the counter offensive will start.

It will cover the waterfront on automation benefits, retraining for new jobs, and a host of other demands.

It might be right to say that speculation now on trouble in 1962 is not only presumptuous, but foolhardy. But not if you look carefully at the speeches and comments since the contract was signed. There is enough evidence to expect a blowup in June of 1962.

No Comments—Few, if any, steel leaders are willing to talk about the potential battle.

It is just as futile to ask Dave McDonald or other union men to make book on what is ahead. But when you take what both sides say, it again spells a steel hassle that could well end up in another strike.

So the next president of the United States may well be called into the steel arena again in 1962. There is even a chance that it will be the same man who almost got a settlement in July, 1959, and finally made it in December. Who knows?

What's the Real Issue?

▪ Some day, both sides in the steel labor struggle must come to grips with the real issue:

What is the future of the steel industry to be? A mediocre industry, a strong industry, or a sick industry?

Involved in this struggle is competition with other metals, competition within the industry, competition with imports. Some forecasts of dire results may be out of line, but there are legitimate fears.

Coincident with the facts of competition, however, is the multi-sided question of automation, displaced workers, increased productivity, new techniques, electronic marvels, and union survival.

Biggest problem is that neither side appears to see the other's point of view. So the biggest problem is communications.

Here is how each side is expected to handle this:

The Industry

Cheered on by its partial success with public relations propaganda in the last steel struggle, the industry will beef up its public and employee relations program to the greatest effort in its history.

Steel companies will bypass the union because they believe they can reach the workers directly where they have not reached the union. This concept has been used time and again in industry.

But the industry believes it has had enough experience to succeed where others have failed. It is confident that workers will heed its messages.

The Steelworkers Union

So far, the union has not digested exactly what the steel industry has in mind. But from its standpoint, it has only one way to try to offset the company-wide communication program. It will haul out the burning questions of displacement due to technological change.

Smarting privately over its wide open contract (to the industry) on new techniques and new plant and equipment, the union will strive to limit that section if it has to give ground on local practices.

The union believes workers will resist divorcement from the union.

But the union will be using old-time methods in its fight with the industry. These may not be enough in view of management's opinion polls, outside assistance, new faces in steel, and results of analysis of past mistakes. There is also the possibility that wholesale changes in negotiators and methods could occur before early 1962.

Probable Outcome

There is no reason to expect any outcome different from what happened in the past. The government eventually will get into the act again. Without the probability of government pressure, the steel union might be brought in line of reasonable action or thinking.

But the personalities—on both sides—and the failure of steel people to study closely what has happened in other industries might mitigate against a calm settlement.

Both sides will fight for the minds of the workers and the public. But neither will gain much until the deadline is but a few months away.

A Shakeout Looms in Aluminum

With Wages Rising, Producers Abandon Profitless Items

Profits are already squeezed, but aluminum industry wages go up 11¢ per hour next month.

Despite competition and excess capacity, price increases are possible. — By G. J. McManus.

■ Aluminum producers are sweating out a new test as they attempt to restore order and profits to a confused market.

Next month, aluminum labor costs go up an estimated 11¢ an hour. With profits already squeezed, producers say this added cost should mean higher prices.

However, no one is sure what will happen. Selective hikes are considered a possibility for sheets, forgings and other products with heavy finishing costs. But competition is putting heavy pressure on aluminum prices. One company official doubts that a general increase would stick.

"Skin of Our Teeth" — This doubt is widespread despite recent moves to relieve overcrowding and tidy up prices. Last month Aluminum Co. of America increased prices of building sheets by 0.5¢ a pound. At the same time, Alcoa reduced to five the number of gages offered in the building line.

Kaiser Aluminum & Chemical Corp. recently stepped out of one market when it reduced its line of soft extrusions. A midwestern reroller is reported ready to call it quits. One major producer describes its position in the extrusion market as "just hanging on by the skin of our teeth."

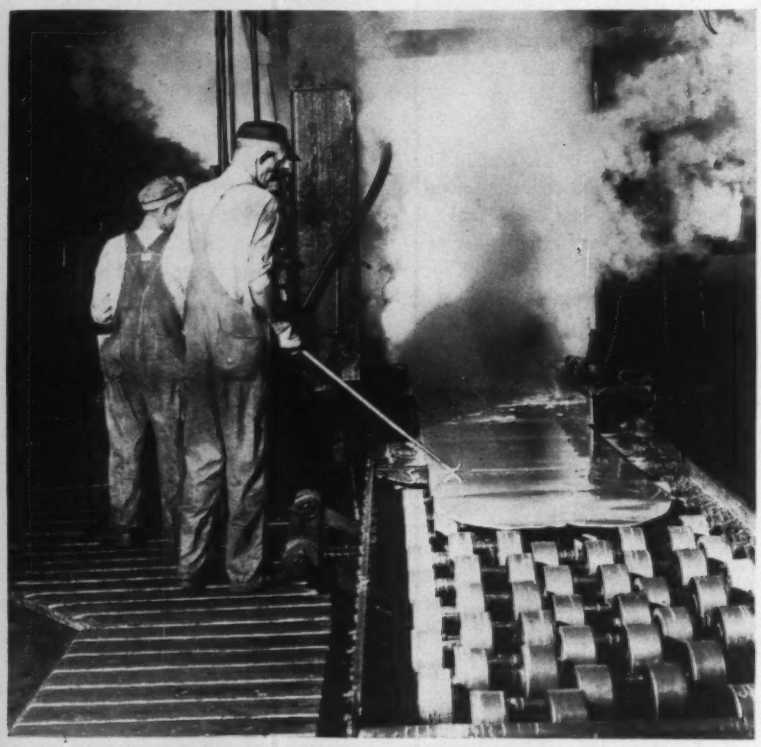
Boom Falls Short — These reports may point to a general shakeout for aluminum. With shipments falling short of boom expectations, producers may be adjusting to the problem of making money in a period of limited prosperity. This adjustment would center on profitless prices and profitless product lines.

Need for new thinking is indicated by the fact that aluminum should be having a good year. After record shipments of 4.9 billion lb last year, the industry got off flying in the first quarter of 1960 with 1.6 billion lb shipped. Sales fell off in the second quarter but producers still expect to top 5 billion lb for the full year.

Capacity to Burn — Aluminum markets have been growing but capacity has been growing faster. This country has 2.4 million tons of smelting capacity now; we will have 2.6 million tons by 1962. Peak production of aluminum was 1.9 million tons in 1959.

With excess capacity to burn, producers have been scrambling for business. Competition has held down official prices; aluminum is now selling at the levels of 1958. Unofficially, there is constant sniping at prices from job to job.

Price Sniping—Competition has weakened prices and it has produced price confusion. Special commodity prices have been adopted for can stock, trailer van extrusions and others. In most cases, the schedules have covered highly specialized applications—can stock has its own specification and is avail-



TIGHT SQUEEZE: Competition and excess capacity are putting just as tight a squeeze on profits in the aluminum industry as the rolls of a sheet mill on a hot slab of the metal.

able in only one or two gages.

However, Alcoa's building sheet fell in a slightly different class. The company came out with it originally as a standard product to be sold for considerably less than specification sheet. Idea was that the volume resulting from standardization would permit production savings.

Misuse and Abuse—The new line was made available in gages from .010 to .080 in. With this range and with a strong price inducement, many customers began buying the standard product instead of specification sheet.

"There was an open invitation to misuse building sheets," says one distributor.

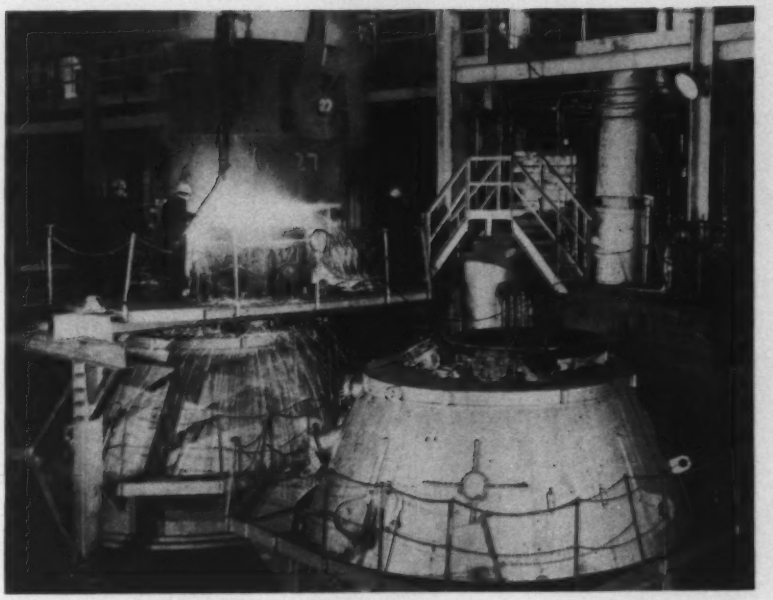
To eliminate this kind of abuse, Alcoa last month cut down on the number of gages offered. The half-cent price increase reduced the incentive to use building sheets in foreign applications.

Price to Destruction? — As another means of control, Alcoa prices its building sheets according to special volume schedules. Normally, aluminum is priced with 30,000 lb as the base quantity. For building sheets, prices start with a 100,000 lb base.

Another significant point in connection with the sheets: Other major producers quickly followed Alcoa's lead in raising prices. This may indicate new recognition that competitive pricing can be carried to a destructive point.

Success or Excess—However, it is too soon to say aluminum has shaken off its growing pains. One producer dropped out of soft extrusions this year but 10 entered the field in 1959. Over 100 new aluminum extruders have set up shop in the past 10 years. There are 36 aluminum sheet-rolling plants in the country.

In addition, competitive conditions tend to produce excessive product variety. Alcoa came out with a colored sheet recently. The company started with 19 shades. In a short time, it was offering over 100.



VACUUM CASTING: Molten steel is being poured into a mold in a vacuum chamber. Later, the ingot will be removed and forged into a steel roll.

Bethlehem Offers Vacuum-Cast Rolls

■ Bethlehem Steel Co. is now producing its entire line of hardened steel rolls from vacuum-cast ingots. Prices remain the same as for former air-cast grades.

The company says that performances recorded over several years show the superiority of rolls forged from vacuum-cast ingots. Several hundred large rolls were produced and shipped during the test period. They went to both ferrous and nonferrous industrial users.

Two Pouring Processes—In vacuum-casting, volume of hydrogen and other gases in the ingot are reduced to a harmlessly low level. As a result, forging ingots are sounder, tougher and cleaner. The possibility of flaking or micro-cracking is greatly reduced.

Either of two methods is used in Bethlehem's pouring process: Molten steel is poured into a pony ladle at the top of the vacuum pouring unit, then into an ingot mold; or from the furnace ladle into a second ladle in the vacuum tank.

Reduces Hydrogen — Steel flows from the pony ladle or the furnace ladle through a high vacuum in the degassing chamber. The flow is actually a spray. Breakup of the hot metal into small droplets releases hydrogen as well as other gases. Tests show about 63 pct of the hydrogen is removed.

Processing and the heat of forging reduce hydrogen in the exterior portions of air-cast ingots. However, inside content remains high. In vacuum-cast steel the hydrogen content is low throughout.

Besides eliminating flaking or micro - cracks, hydrogen removal minimizes embrittlement tendencies in larger forgings.

Giant Welder Forms Composite Dies

▪ A new composite welding machine is capturing the interest of automakers as they prepare to tool up for 1962 models.

Allegheny Ludlum Steel Corp. operates the giant welder, said to be the largest in the industry, at its Forging & Casting Div. plant near Detroit. It will weld a 150 sq in. area in seconds.

The weld joins expensive tool steel alloys to less costly mild steel to form a composite die section. The alloy is used only on the working or cutting edge of the die. The tool steel usually is cut or shaped to the desired design prior to welding, resulting in the need for less tool steel and less work to machine the die into shape.

The dies are used in the auto industry primarily to stamp auto parts out of sheet metal. One die may stamp out a door, another a fender or hood, in much the same way a housewife uses a cookie cutter to stamp out dough.

F. C. Shields, manager of sales at Allegheny Ludlum's Detroit area plant, says customers who have used them report the composite dies represent an estimated 25 pct savings over similar dies machined out of solid blocks of steel.

Process Development Agreement Signed

Strategic Materials Corp. and Universal Cyclops Steel Corp. have signed an agreement for joint development of the use of Strategic-Udy processes in the production of materials for use in stainless steels and/or heat resisting alloys.

Under the agreement Strategic will build a $1.5 million addition to its plant at Niagara Falls, Ont., Canada. It is expected to be in operation by the end of the year.

Frank W. Chambers, president of Strategic, says the Strategic-Udy processes may permit for the first time economical utilization of low grade lateritic and chromite ores in commercial production of high quality stainless steels and/or heat resisting alloys.

Strategic will build the plant expansion and be responsible for its operation. Universal-Cyclops will furnish technical assistance.

Ford Strike Is Settled

Settlement was reached in a week-long strike at Ford Motor Co.'s Cleveland Stamping Plant, Walton Hills, O. For a time the strike crippled output of Ford's new compacts, the Falcon and Comet.

Production was halted at four plants assembling compacts and four which assembled standard cars. But it was the halt in compact production that hurt most. Weekly production at the four plants was about 12,000 Falcons and 5500 Comets, both of which are in short supply.

The company fired four supervisory employees. This was followed by a work slowdown. Ford countered with disciplinary suspensions. This led to the strike. About 3800 workers were idled at the Cleveland plant. Another 15,000 were idled at the eight assembly plants.

USS Modernizes Tinplate Mills

U. S. Steel is going all out to modernize its tinplate facilities. The Corporation is getting ready to install a new, six-stand, 52-in. cold reduction mill, U. S. Steel's first, at the Fairfield, Ala. Works of the company's Tennessee Coal & Iron Div.

The new mill will replace two five-stand mills in use since 1938 and will have a speed of about three times that of former facilities.

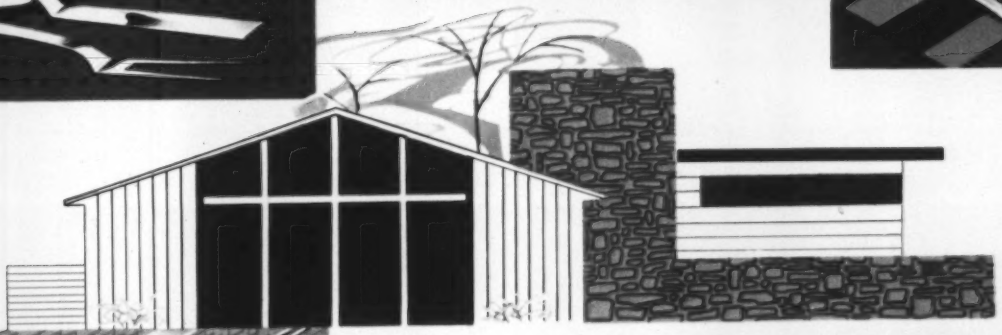
This is a straight replacement of conventional tinplate equipment, USS officials say. And the expansion is not related to production of the special new extra thin tinplate.

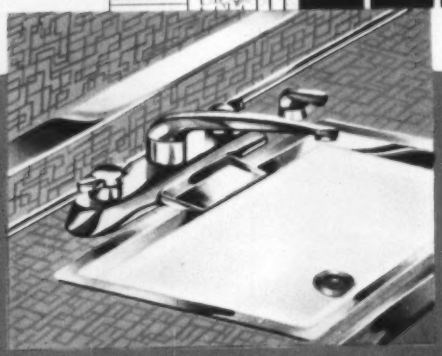
Other Improvements—The mill should be in operation by the early part of 1962. Other major modernization projects there include a continuous annealing line, a 54-in. pickling line, and a 56-in. high speed, heavy duty temper mill.

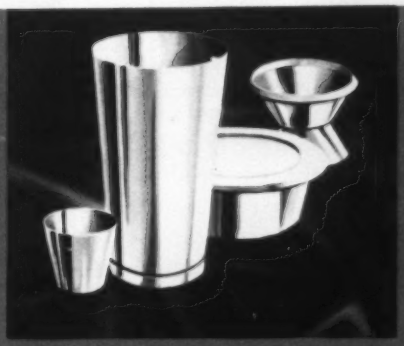
U. S. Steel has also announced the installation of a modern, high-speed continuous annealing line for tinplate production at its Pittsburg, Calif., sheet and tin mill. The line heat treats thin gage steel which is later coated with tin and used to make tin cans.

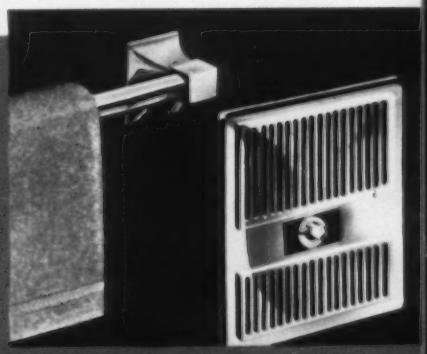
Fine to have around the house

for every stainless reason!









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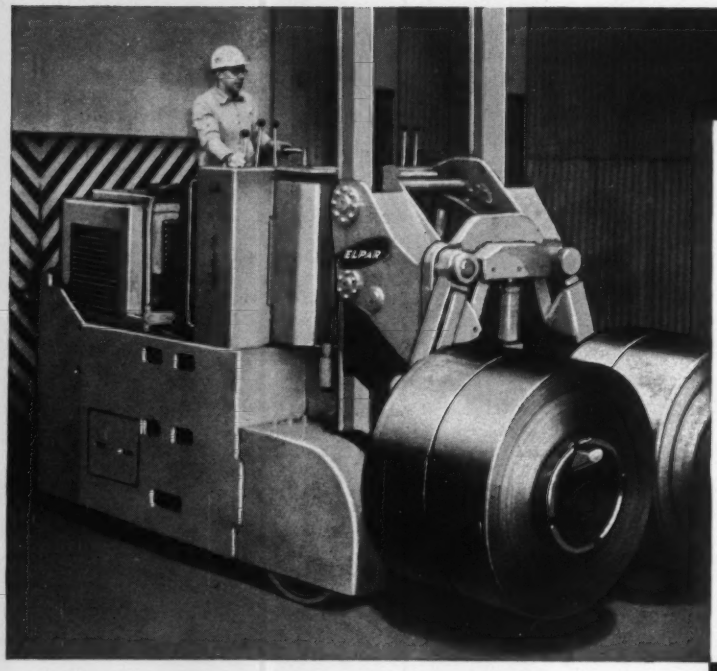
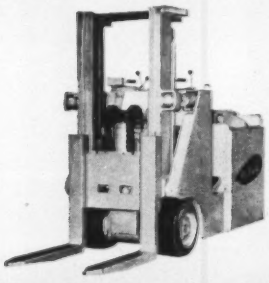
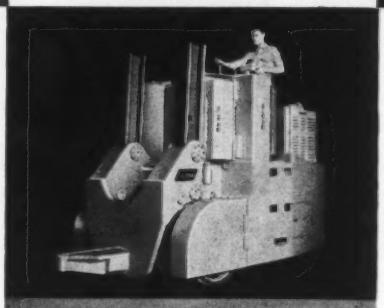
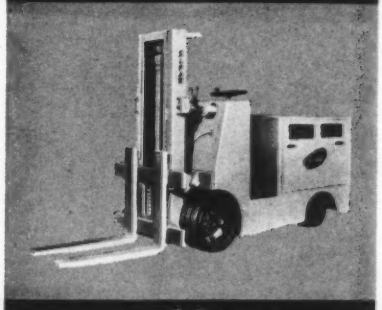


ELPAR
FORK AND RAM TRUCKS







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TWICE THE LIFE . . . ONE-THIRD THE OPERATING COST

Walter F. Sheetz

He Works to Get the Job Done

W. F. Sheetz, president, R. C Mahon Co., is a born hard worker.

He has a great capacity for work and keeps a careful eye on all phases of company activity.

■ As top executive of The R. C. Mahon Co., one of the nation's major building products suppliers and structural steel fabricators and erectors, Walter F. Sheetz has an immense capacity for work.

Hand in hand with a love of labor goes a "need" to know what's going on in each of his company's eight divisions. In a single phrase, his philosophy of management is: "I'm more interested in getting the job done than in the procedures to do it."

The Word — "Getting the job done" has been a personal slogan of the hardworking Detroit businessman since he joined The R. C. Mahon Co. in 1912, its founding year. Starting as a salesman, he worked his way through various sales-management and company officer positions. On the way, he gained knowledge of architectural, construction and industrial requirements. Even today, architects, designers and engineers seek out his views on new construction and industrial projects.

Elected president and treasurer of the company on April 5, 1955, Mr. Sheetz has not lost his zest for sales. He closely follows trends, forecasts and results. He believes strongly in personal contact selling, tight quotations and customer satisfaction.

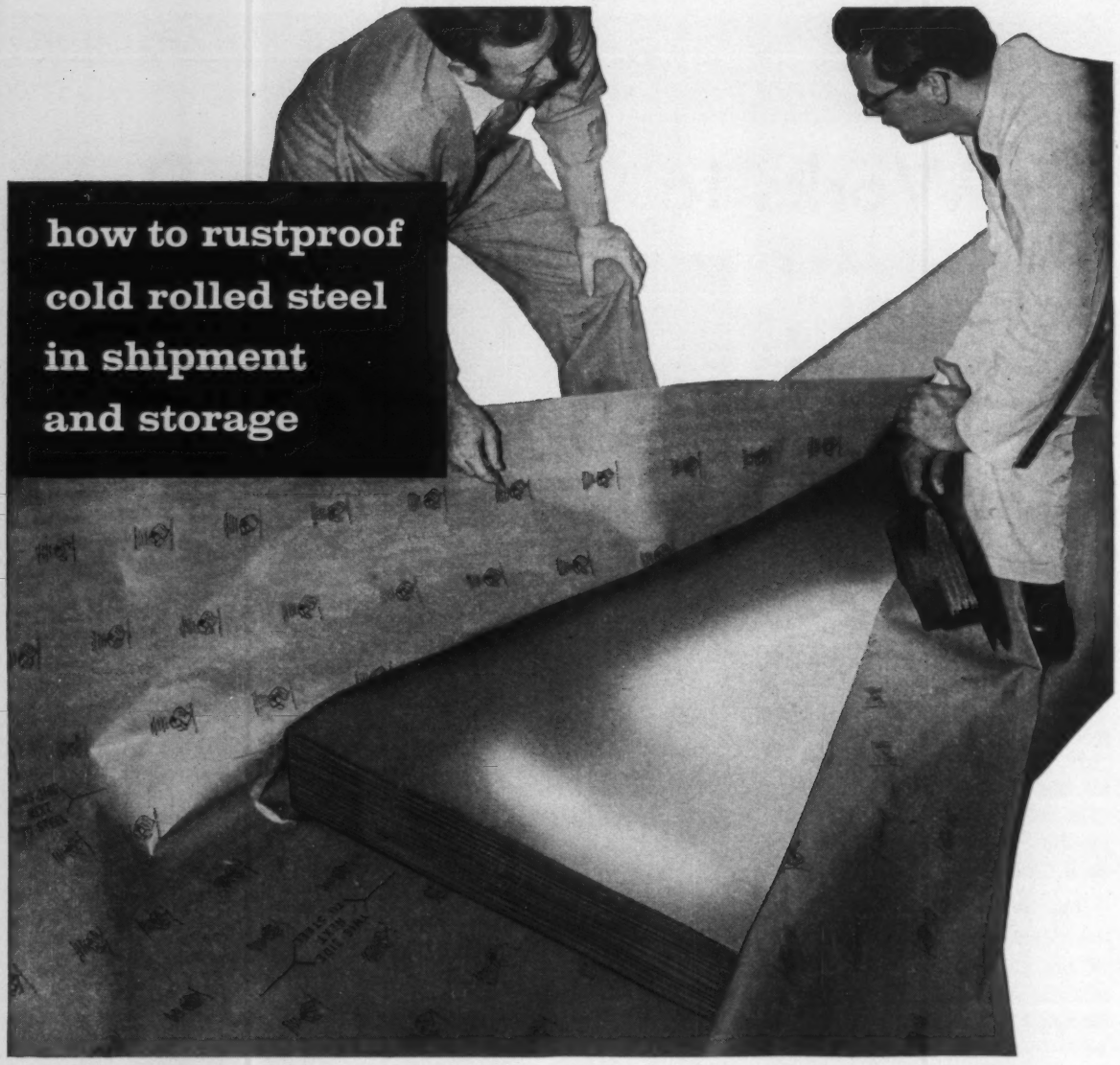
Ready Wit—Sometimes gruff but always understanding, according to intimate business associates, the Mahon president is respected by all who know him. And not only as a manager, but as a completely human person with a ready wit and engaging personality. Two of his largely self-taught accomplishments: A surprisingly fast reading speed and an ability to conduct himself with ease in any surrounding. The latter ranges from a top brass conference to a construction gang get-together.

W. F. SHEETZ: A part time farmer with his flock.

Mr. Sheetz was born in Columbus, O., and educated in the city's public schools before moving to Detroit with his family. Today he and his wife, Estelle, maintain homes in Detroit and a farm estate in suburban Romeo, Mich.

Civic Leader — Very active in civic and community affairs, Mr. Sheetz was largely instrumental in the promotion and building of a local community youth and civic center. Last year he was awarded an honorary L. H. D.. by Detroit's Lawrence Institute of Technology for "humanitarian attributes."

His professional, society and club memberships include the Engineering Society of Detroit, Detroit Athletic Club, the Recess, Indianwood Golf Club, Union League of Chicago, Chicago Engineers' Club and Key Largo Anglers Club.



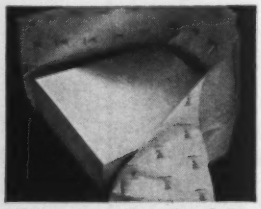
how to rustproof cold rolled steel in shipment and storage

Proved by actual test! Unwrapped steel rusted within a few hours. Identical steel wrapped in Ferro-Pak showed no signs of rust . . . even after several months. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 180 N. Wabash Ave., Chicago 1, Ill. Dept. A7

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.



How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

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For over 38 years—
"Paper Engineers" for Steel

What to Watch in Second Half

During the next few months you'll want to study all business indicators carefully.

But what happens in five factors will be especially important.

■ What's in store for business in the second half?

You'll get a good idea of the trends if you keep close watch on several important indicators. In the months ahead, all economic signposts will be studied carefully. But five will be especially significant.

The Vital Five—How they go may decide if, and when, a severe business dip is coming. The five indicators are: (1) consumer spending for durables; (2) the ratio of manufacturers' orders to shipments; (3) construction activity; (4) capital spending; and (5) the level of inventories.

Here's what to watch:

Consumer Spending. So far this year consumer buying has been a major element of strength. But doubts about business conditions may cause consumers to reduce future buying plans. If this happens, makers of durable goods will feel the greatest impact. Consumer demand is important in moving retail stocks, (now at a high level for most consumer durables), holding up production and employment, and increasing manufacturers' inventories.

Ratio of Orders to Shipments. During the first six months of '60, manufacturers' new orders have been running below shipments. If this trend continues, backlogs will keep declining, with adverse effects on output and employment.

Construction. In the first five months of the year there was little change in the amount of new building. The annual rate of new construction (seasonally adjusted) was $53.9 billion in January. By May it had shown no advance, remaining at the January rate. The freer flow of credit may help from here on out. Residential building, which has been dropping since January, should be encouraged. This, in turn, will benefit makers of appliances and other durables.

Capital Spending. Industry's spending plans for new plants and equipment have been rising so far this year. Business is expected to invest about $2.5 billion more for capital equipment in the third quarter than in the first quarter.

The next IRON AGE survey of metalworking capital spending appropriations (due in September) will show how much money was actually put aside in the second quarter for second half spending.

Inventories. Business inventories increased at an annual rate of about $11 billion in the first quarter of the year. But in the April-June period the rate dropped sharply. Right now, the ratio of inventories to sales is relatively low. It is lower than the level before the 1957-1958 recession in every area.

Preview of Labor Patterns

■ Labor trends aren't expected to change much in the months ahead. What happens to jobs depends, of course, on the health of the economy.

But A. W. Zelomek, economist for the International Statistical Bureau, Inc., expects labor's position to stay "comparatively favorable." Writing in the Bulletin of the National Assn. of Purchasing Agents, he predicts:

Small Changes in Hours—Unemployment will not decrease more than seasonally and the lag in productivity will continue. He believes weekly hours worked will show only a "nominal increase" and overtime payments will lag. This will reflect management's drive to lower operating costs. But "higher labor costs will still be the most important factor in the price structure," he adds.

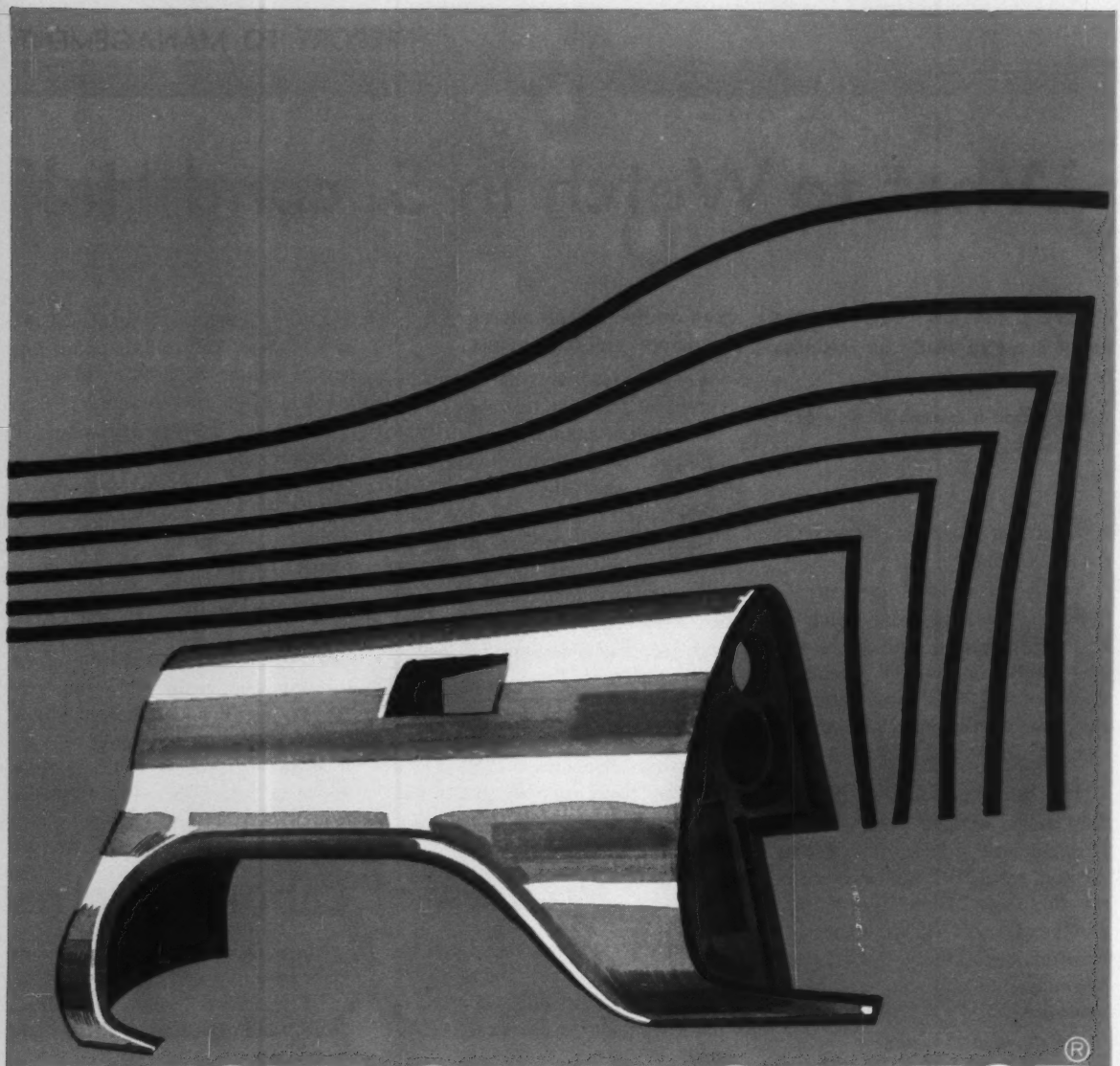
Wage Gains—Mr. Zelomek sees gains in wages and salaries of close to $15 billion when December, 1960, and December, 1959, are compared.

Another trend—the decline in the ratio of manufacturing employees to total employees—will continue for some time.

Employment Rose During June

Total employment in the U. S. reached a new record in June of 68.6 million, the Dept. of Labor reports. This eclipsed the previous high of 67.6 million set in July, 1959.

At the same time, unemployment also rose, reaching a level of 4.4 million, 964,000 above May.



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It's a Critical Time for Auto Sales

Sales Now Will Determine Fourth Quarter Plans

Automakers have one eye on their steel stocks, another on unsold 1960 models.

Cleanup problem is already getting the blame for steel order setbacks.—By A. E. Fleming.

■ What new car sales do in the next 40 to 60 days may be the deciding factor in the fourth quarter.

During that time, the industry will decide whether or not it has a new car inventory problem on its hands. And definite commitments for 1961 model steel will be in.

The Indicators—Although more time is needed to make a firm appraisal of a trend, shreds of evidence show:

(1) Producers may be getting a bit skeptical about a fourth quarter production boom.

(2) They may maintain the same tight-fisted control over steel stocks that has been in effect since spring. The answer will depend largely on new car sales in July and August, and whether they are strong enough to fan the optimism that will be needed for a fall surge.

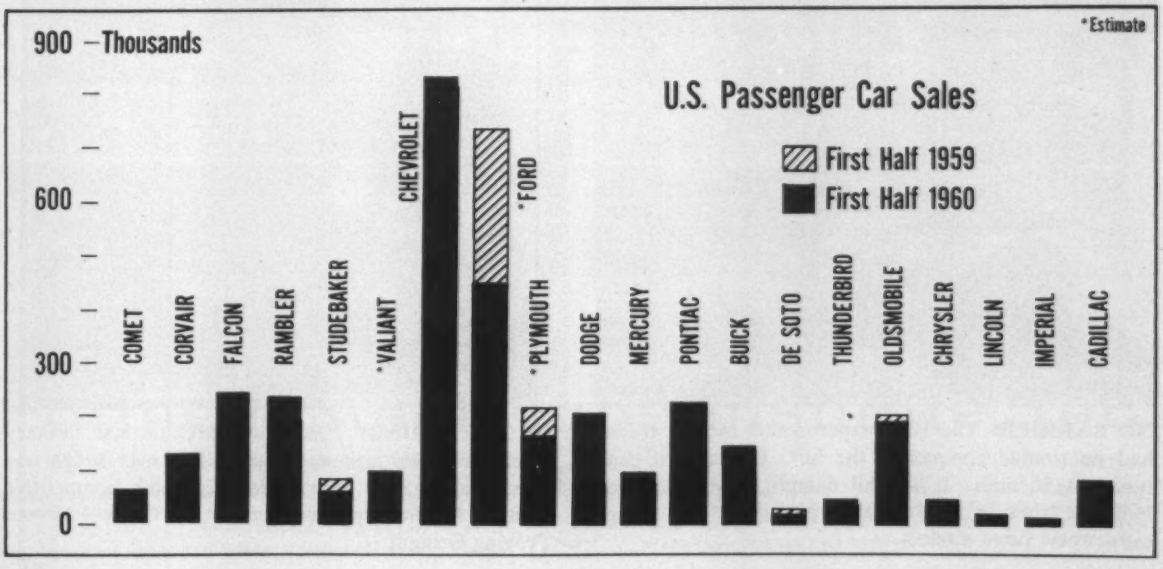
Best in Five, But—Sales in the first half of 1960 were good, the best for the period in five years. They totaled 3,250,000, some 314,000 and 11 pct above January-June, 1959. However, the margin of gain over a year ago has been declining the past couple months.

January volume was 10 pct better than the same month in 1959. February showed a 14 pct rise, followed by 13 pct in March and 15 pct in April. That's when customers who were denied cars in October-December because of the production-stopping steel strike came into the market. But the margin slipped to 7 pct in May, and slumped further to 2 pct in June, a situation that was not at all appealing or expected.

Looking Ahead — Auto officials are not outwardly pessimistic, though. Instead, they are looking for another spurt, one that will enable them to outsell July-September last year by 10 pct. This means they are setting roughly 1.5 million sales as their third quarter goal. If they reach it, they will have to sell another 1.5 million in October-December to reach the 6.2 to 6.3 million level they expect in entire 1960.

Tied to the tale of third-quarter sales hopes are the many unsold new cars parked in dealer yards. In face-to-face talk, auto men still show no fear of the big stockpile. June sales of 593,000 cars compared to production of 613,000 cars. The difference of 20,000 cars

Can Automakers Hold Gains, Recoup Losses?



went into inventory, which stands at a record 1,089,000 as of June 30.

Second Thoughts — It may or may not be the inventory, but car makers may be starting to think twice about fall steel needs. Just after the July 4th holiday, several Detroit area steel sales offices were told by automakers to hold back some of their August deliveries until September. In the case of one major auto stamping plant, as much as half of its August orders were postponed until September.

Steel men are quick to point out this is nothing to get alarmed about. It's been happening most of the year, and was quite common in July. But some complain that whereas August had been developing into a really big month for steel deliveries, it now is turning into a pretty average month.

How Much Inventory—But car production may not be the problem. It may be steel inventory. Heated discussion, between purchasing director and manufacturing manager, over steel requirements has been going on at more than one auto company. Up to now the purchasing man with his rigid inventory platform has been winning out.

So far it's too early to point to a trend in the making. There will be more concrete evidence when September steel orders come in. This will be the true indicator of fourth quarter car making plans.

Board Chairman Resigns at Ford

Ford Motor Co. reorganized its top management last week. Ernest R. Breech resigned as chairman of the board, he had held the position since 1955. Henry Ford II succeeds him. Mr. Ford will also continue as president of the company.

Mr. Breech will continue to serve as a member of the board of directors. In addition, he has been named chairman of a newly created finance committee.

Routine Changes — The move puts all management powers and responsibilities in the hands of Mr. Ford. But the move is unlike the management shuffle that hit Chrysler Corp. three weeks ago. In the case of Mr. Breech, it's generally believed he just wanted to lighten his work load after nearly 15 years of active leadership at Ford.

Mystery Change — At Chrysler, board chairman L. L. Colbert took on the additional duties of president when William C. Newberg suddenly resigned. Mr. Newberg quit after holding the job only two months.

Industry executives are still guessing at the reasons. Chrysler's only comment was that he resigned over "policy differences." Adding to the mystery is the fact that Mr. Newberg had always been considered to be Mr. Colbert's hand-picked successor.

Autolite Automates

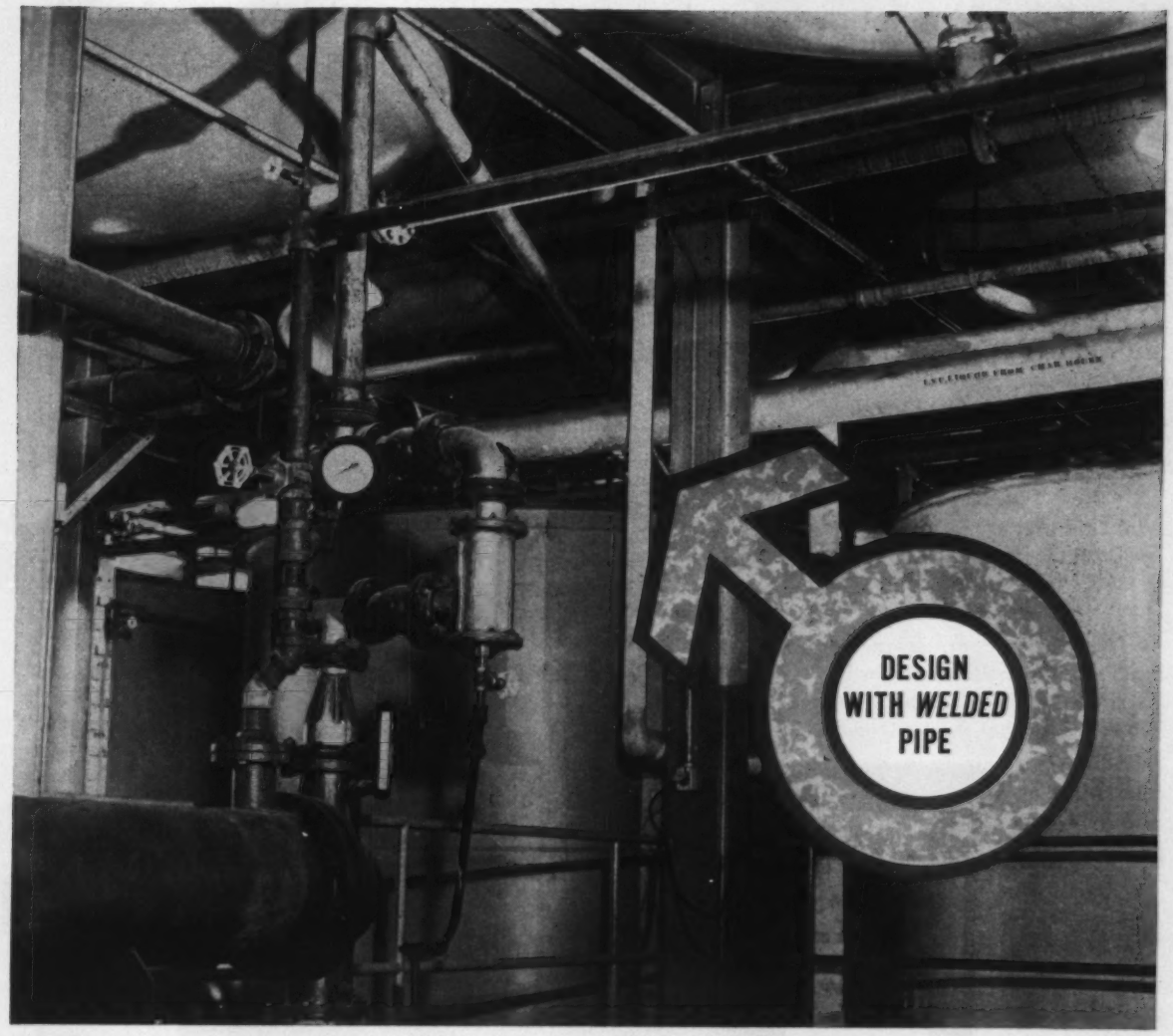
The Electric Autolite Co. has started construction on a new multi-million dollar electrical parts plant at Decatur, Ala. The plant will represent an investment of $6 to $7 million dollars by the time production gets under way next spring, according to J. J. Bohmrich, Autolite vice president.

The new plant will produce regulators, distributors, solenoid switches, relays governors, condensers and related automotive and industrial electrical products.

Experimental Trucks Take to Land and Water

NO BARRIER: The Ford experimental tactical truck had no trouble conquering the hill. On land, it can travel at 50 mph. It will hit 6 mph in water. Ford built the truck in 3.5 ton, six wheel drive and 5 ton eight wheel drive models.

IN THE DRINK: This new GMC tactical military truck moves through water as well as over rough terrain. Vehicle was built under 12 month competitive contract for the Army and tested at the General Motors Proving Ground.



LC-608

WELDED STAINLESS PIPING WINS

on "killer" duty in Southern Sugar Refinery

Corrosive liquors piped over long distances in this sugar refinery service—often at temperatures of from 180°F to 220°F—played havoc with non-ferrous metal piping. Down times occurred two or three times a year for pipe replacement and costs climbed accordingly . . . until welded stainless pipe entered the picture. Now, with Type 347 stainless on the job the problem is solved.

Frequent down times are eliminated, thanks to the alloy's superior corrosion resistance, and as an important bonus, freedom from product contamination is achieved. • Why not check into the profit possibilities of modern welded steel piping in your own operation? Ask for helpful Bulletin 8591—and consult a quality welded steel pipe producer in your district.

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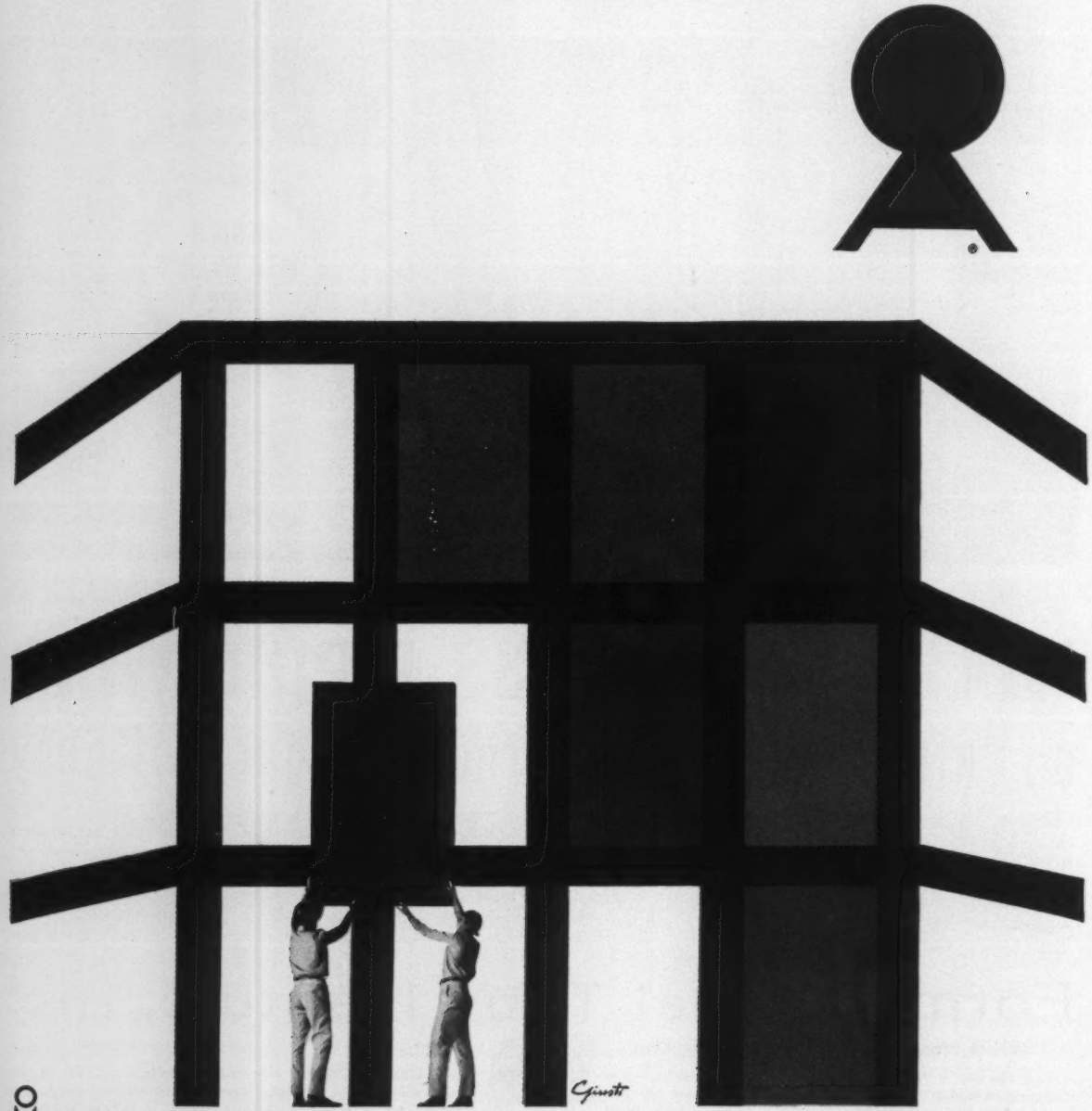

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Who Needs That $700 Million?

Congress Appropriates, Ike Hesitates

Pentagon cheered when Congress authorized an extra $700 million for defense spending.

Now, the question is whether the Administration will spend the funds.—By R. W. Crosby.

▪ The extra $700 million Congress appropriated for defense remains a question mark.

Will the Eisenhower Administration allow it to be spent?

When the $40 billion budget—with its $700 million more than the President wanted — was approved, Pentagon officials were pleased about the excess. They said it would give them flexibility.

Then came the news that almost none of the added money would be spent by the administration.

A Reversal—A few days later, it seemed that the administration had reversed its stand. Defense Secretary Thomas Gates said:

"I'm sure we want to use some (of the additional money) to expedite some of the weapon systems we have on the way."

Meanwhile, Senate Majority Leader Lyndon B. Johnson said it was the intent of Congress that the money be spent. He urged top defense officials to spend it.

Latest information from the Pentagon is that most of the money will not be spent, at least by this Administration. If true, the new U. S. President will have money in the bank for emergency defense spending.

Halts Plans—This decision to hold off spending the extra funds halts plans on certain military projects. To the military it means:

The Army will not get the extra $121 million for modernization of equipment.

The Navy will not get $400 million voted by Congress for two more Polaris subs and three attack subs.

The Air Force will not get the extra $190 million voted for the B-70 airplane; $85 million for spare parts and practice for an airborne alert; $100 million for more F-106 fighter planes; $50 million for new cargo planes; and $83 million for development of the Samos spy-in-the-sky satellite.

Of course, the world situation could change defense plans at any time. Then we will see the Administration reversing itself again.

A Voice on Tariffs

It will be a month before U. S. metal manufacturers go before the Tariff Commission to oppose the lowering of import duties. But already the opposition is being heard.

Nelson A. Stitt, director of the U. S.-Japan Trade Council, told the commission last week that import duties on some steel mill products could be lowered as much as 20 pct without doing any harm.

Stitt claimed the present level of steel product imports offers no serious injury to the nation's steel industry. He said:

"Foreign producers can offer limited competition but not on a scale to disturb greatly our highly productive basic industry."

U. S. metalworking representatives will get their turn to testify when the commission takes up metals and metal manufactures August 25 to September 8.

Metalworking Jobs Are Stable

▪ Employment in the basic steel and fabricated metals industries is expected to remain stable through the summer. But there will be some decline in key areas.

The Dept. of Labor reports that employers in the steel industry hope to maintain their employment at or near current levels through July and August. Current levels, of course, are well below the high totals of the first of the year.

Hour Reductions — The Labor Dept. said work week — rather than employment—reductions were planned in some places. Pittsburgh and Chicago plants report a further slight decline in payroll totals was possible by mid-July.

Some segments of the fabricated metals industry may continue to move upward. But the industry's job totals will show little net change.

Seasonal growth, paralleling jumps in food processing and construction jobs, is forecast in centers producing metal food and beverage containers and metal building products. Chicago, Milwaukee, Los Angeles-Long Beach, San Francisco-Oakland, Baltimore, and New York City are among key areas reporting gains in these sectors.

On the other hand, the Labor Dept. says, many areas which produce auto parts look for a further decline in metal product payrolls this month. Heaviest declines, unless the recent auto pickup reverses the trend, are slated for Detroit, Cleveland, Flint, Toledo, Grand Rapids, and Akron.

Read how the *Taylor-Tot* people realized important SAVINGS with switch to DSC-PORTSMOUTH LPR COILS

2000 pound LPR's have reduced downtime frequency by about 86%; slashed scrap loss proportionately; upped production 12 to 15%; eased the fabricating job.

Here are direct quotations from a May 27, 1960 letter written by W. N. Muchmore, Vice President of The Frank F. Taylor Company

TESTING—"Several months back your Cincinnati office suggested your long production run coils. Frankly, we were skeptical of the advantages claimed. About six weeks ago, however, we ordered a truckload in 2000 pound coils so we could, from actual experience in our factory, determine if they would be more economical than the 300 pound coils we used for years."

RESULTS

UNLOADING TIME CUT 82%—"Your initial shipment was unloaded with our fork-lift truck by 1 man in 1¼ hours. Like shipments of 300 pound coils always took 2 men 3½ hours each with the same equipment. Reporting the time saved, our receiving clerk questioned, *'Why didn't we do this a long time ago?'* "

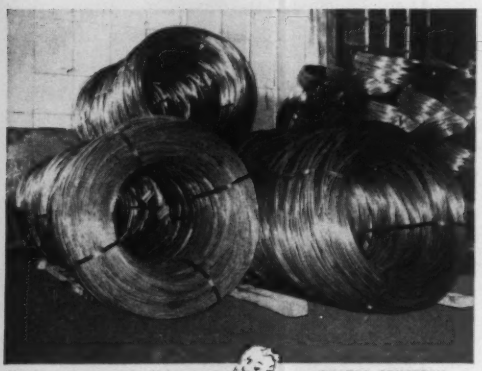
STORAGE SPACE HALVED—"The 2000 pound coils stock more compactly than the 300 pound coils, saving us about 50% in floor area for the same weight of wire."

PRODUCTIVITY UP 12 TO 15%—"With the big coils, our two S&C machines straighten and cut 12 to 15% more wire than previously with the small coils and in the same length of time, due to reduced downtime for coil changes."

LESS DOWNTIME, LESS SCRAP, MORE TIME—"With fewer coil changes, we get less coil-end scrap losses and our S&C operator now has time for other work in his department. His reaction, 'It makes my job easier.' "

CUSTOMER SATISFACTION—"The savings realized have more than justified our switching to 2000 pound LPR's. *We can recommend them to any manufacturer still using small coils.*"

Care for more facts about best-in-the-long-run LPR's or other DSC products? Get quick action from your nearest DSC Customer "Rep" or write: Detroit Steel Corporation, Box 7508, Detroit 9, Michigan.



Notice the accessible, compact way high-density LPR's stack in contrast to the sprawling heap of 300 pound bundles at right.

PHOTOS COURTESY THE FRANK F. TAYLOR COMPANY, NORWOOD, CINCINNATI, OHIO

The T-95 *Taylor-Tot* Folding Sleeper-Walker-Stroller using DSC-PORTSMOUTH LPR BRITE WIRE COILS for axles, bumpers, supports, utility baskets, canopy frames, etc.

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How to Read Democratic Platform

Liberal Planks Promise Something for Everyone

The broad liberal platform adopted by the Democrats will put the pressure on the GOP for a similar program.

This is a principal conclusion gained from on-the-spot convention coverage.—By R. R. Kay.

■ As the Democratic delegates packed up and left Los Angeles last week, some remnants of interest to business and industry remained.

The candidates, Sen. John F. Kennedy and Sen. Lyndon B. Johnson are committed to campaign on the broadest "cradle to the grave" platform ever adopted.

And even before the election, bigger spending may be expected in Congress as the Democrats set the pattern of issues.

Some Conclusions — These are some conclusions gained on the convention, in party caucuses, talks with candidates and would-be kingmakers.

Party promises:

1. A vigorous economy. The Gross National Product can and must grow at an average rate of 5 pct per year. That's almost twice as fast as our annual rate since 1953.

2. Flourishing world trade. To sell, the U. S. must buy in world markets. World trade, Democrats say, raises living standards, widens markets, reduces costs, increases profits, and builds political stability and international cooperation.

3. More money for defense. Sen-Kennedy called for an extra $2.5 billion to $3 billion to be thrown into the pot. He says the money should be appropriated when Congress reconvenes in August.

Does this mean a tax increase? "If necessary, yes," says the nominee.

All in all, it's a broad platform aimed at every voter.

Some Pledges—You name it, it's there: Economic growth, an end to tight money, minimum wages, collective bargaining assurances, full employment, civil rights, housing, welfare, and a program for the aging. But then, who remembers platform pledges after the election?

But it's a safe bet that after the Democratic platform, the pressure will be on the Republicans to come up with a liberal platform.

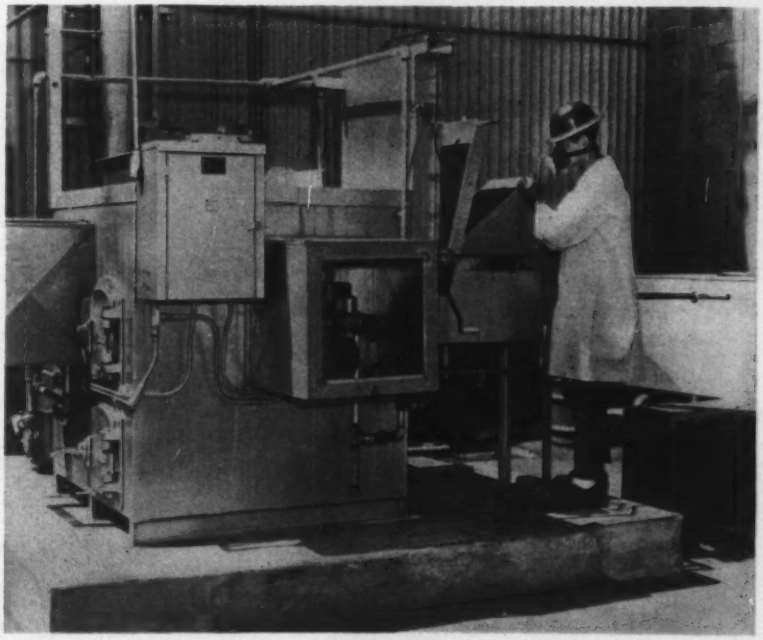
The country can now get ready for three months of promises and counter promises. And if the nation's economy should slow down during the autumn campaign, you can look for some fast moves on the part of the Administration to pump some prosperity into it.

Computer For Tempe

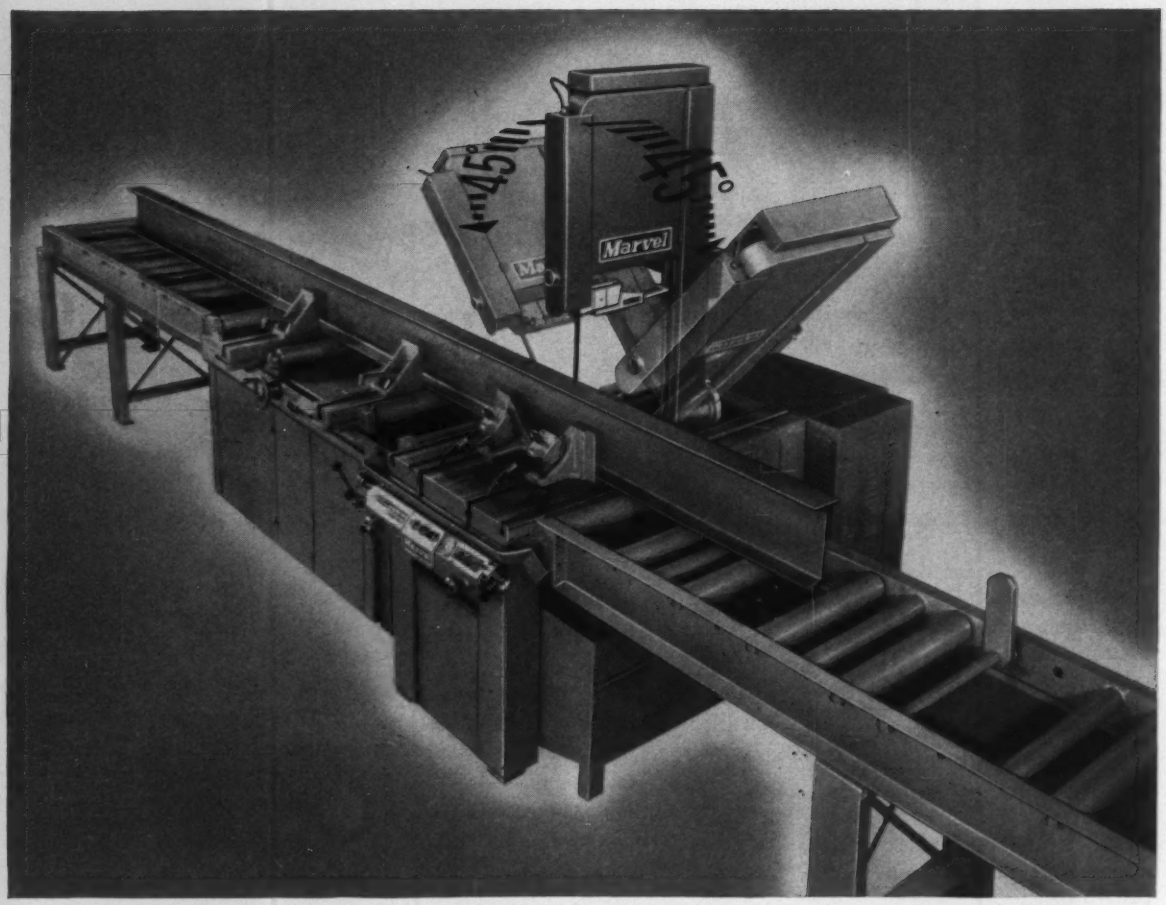
General Electric Co.'s Computer Dept. is installing a $1 million data processing system at Arizona State University, Tempe, Ariz.

The system, known as the 304, replaces equipment installed at the Computer Center when it was established by Arizona State and GE in 1957.

Incinerator Helps Reduce "Hot" Material



CUTS DISPOSAL COSTS: Incinerator at General Electric Co.'s Atomic Power Equipment Dept., San Jose, Calif., reduces cost of getting rid of contaminated wastes from plant's nuclear fuel manufacturing operations. Disposal costs are reduced 75 pct with use of the unit.



Tips Its Head To Cut Production Corners

Sawing 45° miters in any kind of material has always been a simple task for MARVEL Saws, but moving the work up automatically and making consecutive cuts on an angle was a problem, especially when the work was long and cumbersome.

This triple exposure photograph of a new MARVEL No. 81A All Hydraulic Heavy Duty Automatic Bar Feed Band Saw, illustrates how the upright head or column can be tipped 45° either right or left of vertical to make angle or miter cuts. The work is held stationary while the column, which carries the blade, is fed forward, meeting the work squarely to insure accurate cutting. After the cut is completed, the work is automatically moved up and measured, and another cut made.

Automatic miter cutting is just one of many exclusive universal features of these band saws. Designed to utilize every advantage of high speed steel band blades, MARVEL No. 81 Series Band Saws can handle almost any conceivable sawing job—from the smallest, most delicate work, up to 18" x 20" shapes.

Only the MARVEL No. 81 Band Saws have the "SURE-LINE" Automatic Accuracy Control (basic patent applied for) which literally steers a blade to make a straight cut. This unit extends usable blade life as much as 50%.

MARVEL No. 81 Series Band Saws are proving themselves daily, as the most versatile machine tools in production metalworking plants.

For complete details, or a demonstration of MARVEL Sawing Equipment, write: Armstrong-Blum Manufacturing Co., 5700 W. Bloomingdale Ave., Chicago 39, Ill.

MMT·PE

MARVEL Metal Cutting SAWS

Better Machines-Better Blades

New Tools Show Rate of Progress

Gisholt Lathe an Example of New Machine Tools

This year's Exposition will show rate of progress of the industry in the past five years.

New turret lathe is an example of progress in production versatility.—By R. H. Eshelman.

■ How much better are the new machine tools being readied for this fall's Machine Tools Exposition? Plenty, according to early signs. For instance, here's a new automatic turret lathe. Compare it with earlier 1955 models and it hangs up new records in production and versatility.

Part of the story lies in controls. Designers of the new lathe, Gisholt Machine Co., point to the dial feature. This permits selection of feeds through flow-control dials on the headstock. Change in setup takes less than a minute per turret. This compares with about six minutes per station on 1955 models.

Flip the Switch—Another feature is a toggle switch electrical panel. This cuts time 50 pct over pre-1955 models and permits preselection of machine functions and speeds by the operator's flipping switches.

Except for the usual tool setting and normal trial cuts, all speeds, feeds, and functions are pre-set in this way within 15 minutes. Comparable time on the earlier model—45 minutes.

"Don't think that jobs requiring full hex turret and cross slide tooling are the only ones that turn a profit when run on automatic lathes," assert Gisholt engineers. On many jobs only two or three stations are needed to complete an operation, they explain.

How Long a Run—If standard tools are used, the hexagon turret can be double or triple tooled to complete two or three pieces per index. Setup for this kind of operation would depend on the size of run.

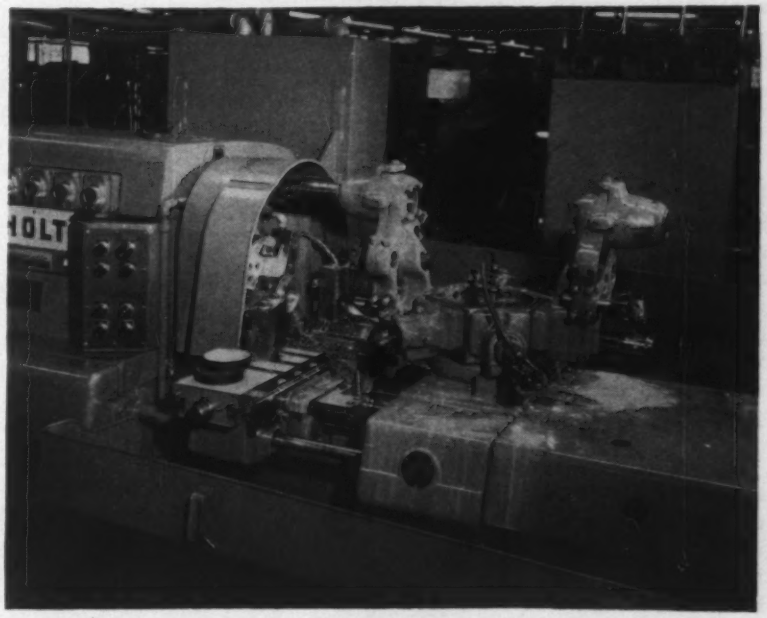
Where special tooling is needed, a longer run is necessary or frequent repeat orders must be assured to justify two or three sets of identical tooling.

On short, non-repeat or "one-shot" runs that do not warrant double or triple tooling or special tools, time can still be saved. Putting work on such partially tooled automatics also assumes optimum tool life and consistent quality.

More Developments—Two production lathes in use at Sheldon Machine Co., Chicago, demonstrate the value.

Parts of steel clutch gears are produced in lots averaging 500 pieces in a variety of sizes and types. When machining times match, parts are moved from one machine to the other for first and second operations. When times differ greatly or when rush orders come in, they may be tooled on different parts.

The new automatic is tooled for first operation machining on an apron clutch gear. The blank, sawed from bar stock is chucked. Only three hex turret stations are used. They drill, turn part of O.D., finish bore and chamfer. Work is rough and finish faced from rear and front cross slides. Time: 4.8 minutes.



FAST SETUP: Steel apron clutch gear is tooled on Fastermatic Gisholt lathe with FeeDial controls. Hex turret stations drill, turn O.D. chamfer, finish bore and ream with rough and finish facing from rear and front cross slides. Ten pieces per hour at 80 pct efficiency.

INDUSTRIAL BRIEFS

Gerrard Moves—A. J. Gerrard & Co., manufacturer of steel strapping and related equipment, has moved to a new plant at 400 E. Touhy Ave., Des Plaines, Ill. The 80,000 sq ft plant is equipped with the latest automatic equipment for producing steel strapping and strapping tools. It is double the size of Gerrard's former plant in Melrose Park, Ill.

A Toledo Supplement—Production Machinery Corp., Mentor, O., has acquired The Rathbun-Jones Engineering Co., Toledo, O., custom builder of machinery. Production Machinery designs and builds steel processing machinery. The Toledo plant will supplement present manufacturing facilities of Production Machinery in the greater Cleveland area.

Inland Completes Plant—Inland Steel Products Co., Milwaukee, has completed a new $280,000 manufacturing plant in Fremont, Calif. It replaces smaller facilities at Hayward, Calif., and will produce several types of Inland steel roof deck for the Pacific Coast market. A 7¼ acre tract was purchased to provide for future expansion.

To Increase Capacity—General Electric will build a $3 million plant for the manufacture of basic silicone intermediate chemicals. Present facilities will be converted to serve other manufacturing needs at GE's Silicone Products Dept. in Waterford, N. Y. The new plant will increase capacity of intermediate silicones to beyond 1965 levels.

Anderson Bought—Yuba Consolidated Industries, Inc., has purchased the K. W. Anderson Co., Tulsa, Okla., manufacturers of high temperature furnaces. Anderson is being consolidated with the Petro-Chem Development Div. of Yuba. Sales activities of the combined organizations will headquarter out of Tulsa.

Management Consultant—W. C. Potthoff, has entered the management consulting field with offices in West Chester, Pa. He was active in the organization of the Ultrasonic Manufacturers Assn. and became its first president. Mr. Potthoff recently resigned as executive vice president, Aeroprojects, Inc., and as president of Sonabond Corp.

Cooper-Bessemer Builds — The Cooper - Bessemer Corp., Mount Vernon, O., will build a new facility to house its En-Tronic Controls Div. Formed in January, 1960, the Division is being set up to handle complete systems engineering for precise control of engine and compressor units. The new building will house engineering, assembly and office facilities.

Company Formed—The Brown Fintube Co., Elyria, O., has formed the Brown Aluminum & Chemical Co. It will specialize in chemical uses of aluminum for the basic steelmaking, stainless and foundry industries. Administrative offices are located at 350 Huron St., Elyria. The factory is located in Garfield Heights, O.

New Facilities—An office and research facility is being built for Atlas Titanium Ltd. in Welland, Ont. Atlas Titanium Ltd. is a special metals subsidiary of Atlas Steels Ltd. The new building will contain a lab and fabricating facilities for the development of reactive metals.

"Miss Toggle, what's the ceiling price on these bolts?"

Change of Name — Fullerton Steel & Wire Co., Chicago, has changed their name to Fullerton Metals Co. Products added to Fullerton's stocks other than carbon steel are stainless steel, brass and copper, aluminum, and magnesium. Similar name changes will be made in its operations in Milwaukee, Miami, Tampa, and Minneapolis where a new warehouse will be opened on August 15.

New Plant — American Metal Climax, Inc. will build a $7 million plant in Vicksburg, Miss. to produce nitrate of potash and chlorine. By employing a new process, nitrate of potash will be available at chemical fertilizer prices. The plant will be operated by Southwest Potash Corp., a Div. of AMAX. Operations are expected to begin in October, 1961.

Buys Kling Line — The Hill Acme Co., Cleveland manufacturer of heavy and special machine tools, has purchased the entire product line of Kling Brothers Engineering Works, Chicago. Kling products will be manufactured, distributed and serviced from the Hill Acme Co. plant in Cleveland. The Kling Brothers Engineering Works is a Chicago machine tool builder.

License Granted—Armco Steel Corp. has granted a license to Republic Steel Corp. to produce and sell the precipitation - hardenable stainless steels developed and patented by Armco. Republic also has been granted the right to use Armco's trademarks 17-7 PH, 17-4 PH, and PH 15-7 Mo with reference to the licensed products.

New Warehouse—The American Can Co. has purchased more than 13 acres of land in Coloma, Mich. A new warehouse will start immediately for the Canco Division. Occupancy is anticipated about September 1. The property has rail and truck facilities and sufficient land has been bought to enable further expansion.

Anneal 430 Trim Stock and All Other Stainless Strip to a Durable, Mirror Finish *Without Chrome Depletion* in

THE ELECTRIC EF FURNACE CO.
GAS • OIL • ELECTRIC

Continuous *Stainless Strip Bright Annealing* Furnaces

Check these outstanding advantages

✔ **DESIGNED AND BUILT BY THE WORLD'S MOST EXPERIENCED BUILDER OF STAINLESS STRIP BRIGHT ANNEALING FURNACES.** 15 efficient, high production lines installed or under construction. EF has more installed capacity, and more experience in bright annealing stainless strip than any other furnace manufacturer.

✔ **VERTICAL OR HORIZONTAL DESIGNS**—whichever best suits your building conditions and specific production requirements.

✔ **FUEL FIRED OR ELECTRICALLY HEATED**—to use whichever heat is most economical in your plant. No restriction on width. Electric furnaces heated with our proven cast alloy resistor elements, assuring highly efficient heating. None better.

✔ **EF JET OR STATIC COOLING**—jet or combined jet and static cooling, shortens the cooling section.

✔ **HYDROGEN, DISSOCIATED AMMONIA OR VACUUM PROCESSING.** Continuous vacuum furnaces, one of EF's latest developments, save on overall installation and operating cost.

✔ **COMPLETE UNIT RESPONSIBILTY**—furnished completely erected with all controls, terminal equipment and product handling, ready for immediate on-line operation.

For the highest finish, and most durable corrosion resistant surface, contact the EF heat treating engineers. ***You'll find it pays!***

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THE ELECTRIC FURNACE CO.

Gas-fired, Oil-fired and Electric Furnaces for Heat Treating any Product, Using any Process, any Hourly Output.

400 West Wilson Street *Salem - Ohio*

Branch Offices in Detroit, Mich., Santa Ana, Calif., and Cheshire, Conn. Canadian Associates, Canefco Limited, Scarborough, Ontario

MEN IN METALWORKING

John Mihalic, named president, Crosley Div., Avco Corporation.

Climax Molybdenum Co.—**Wallace Macgregor,** appointed president, and elected vice president, American Metal Climax, Inc., the parent company. He succeeds **Frank Coolbaugh,** president of AMAX.

Lincoln Metal Corp. — **Norman Ruderman,** named vice president, purchases and sales, nonferrous scrap metal.

Houston Fearless Corp.—**T. C. Clark,** appointed vice president.

Tube Turns Plastics Inc.—**J. P. Knopf,** elected vice president.

Fort Wayne Metals, Inc.—**F. B. Didier,** named vice president and treasurer.

Reynolds Metals Co. — **R. E. Cole,** named asst. plant manager, St. Lawrence aluminum reduction facility, Massena, N. Y.

The Carborundum Co., Refractories Div.—**O'Mara White,** named West Coast regional sales manager.

Union Carbide Metals Co.—**R. L. Reed,** appointed general sales manager.

U. S. Steel Corp., National Tube Div.—**J. B. Willmering,** appointed asst. manager, oil country tubular products.

The Babcock & Wilcox Co., Tubular Products Div. — **J. A. Menster,** named manager, welded tubing sales.

The Youngstown Sheet & Tube Co. — **G. W. Millman,** appointed supervisor, employment and **Andrew Kalapach, Jr.,** named asst. supervisor, Chicago district.

Clark Equipment Co. — **E. A. Keen,** appointed asst. comptroller, Buchanan, Mich., headquarters.

Universal - Cyclops Steel Corp.—**W. M. Rudolph, Jr.,** appointed plant industrial engineer, Bridgeville, Pa.; **W. A. Cusick,** named asst. superintendent, sheet mills, Bridgeville plant; **J. L. Ballantyne,** appointed asst. superintendent, Wide Band Dept., Bridgeville.

J. H. Harris, appointed administrative vice president, Weirton Steel Co., Div. of National Steel Corp.

Penn Metal Co., Inc., Pacific Div. — **J. B. Wasson,** appointed manager, expanded metal sales, Los Angeles headquarters.

J. H. Williams & Co., Tools Div. —**T. M. Sweeney,** appointed field sales manager.

The Euclid Electric & Manufacturing Co. — **C. R. Roehrer,** named sales manager.

Research-Cottrell, Inc. — **Dr. Philip Cooperman,** appointed director, research and development.

SKF Industries, Inc. — **W. C. Wright,** named general manager, Altoona Div.; **J. A. Graham,** named production manager; **Stanley Kabala,** appointed plant manager,

(Continued on P. 123)

S. R. Stout, named vice president, sales, Glascote Products, subsidiary of A. O. Smith Corp.

H. E. Robinson, appointed asst. to the president, Jones & Laughlin Steel Corp.

Irving Whitehouse, appointed director, research, Republic Steel Corp.

Can you get more wear from your shear knives?

A·S·K for the answer!

Should your shear knives last longer? Could the cuts be more uniform and precise? Could the cost be lower? Get the answers from A.S.K.!

A.S.K. stands for American Shear Knife Company, the steel industry's leading authority on shear knife operation and production.

More than 90% of the nation's rolling mills call upon A.S.K. engineers (stationed in most key cities) to survey problems of knife life, cutting quality and operational costs. A.S.K. draws upon years of research in conjunction with top steel mill laboratories to select proper alloys and apply correct techniques in the heat treatment and precision machining of knives. It is this "custom" procedure that makes most A.S.K. knives last up to twice as long, give uniform precise cuts and reduce maintenance and replacement costs.

FREE SURVEY—Join the leading companies* who have asked A.S.K. to survey their metal-shearing operations. At no cost or obligation, A.S.K. will send an engineer to your plant to analyze your problems and make cost-cutting suggestions. Just write to American Shear Knife Company, Homestead, Pennsylvania.

A·S·K

AMERICAN SHEAR KNIFE

**names supplied on request*

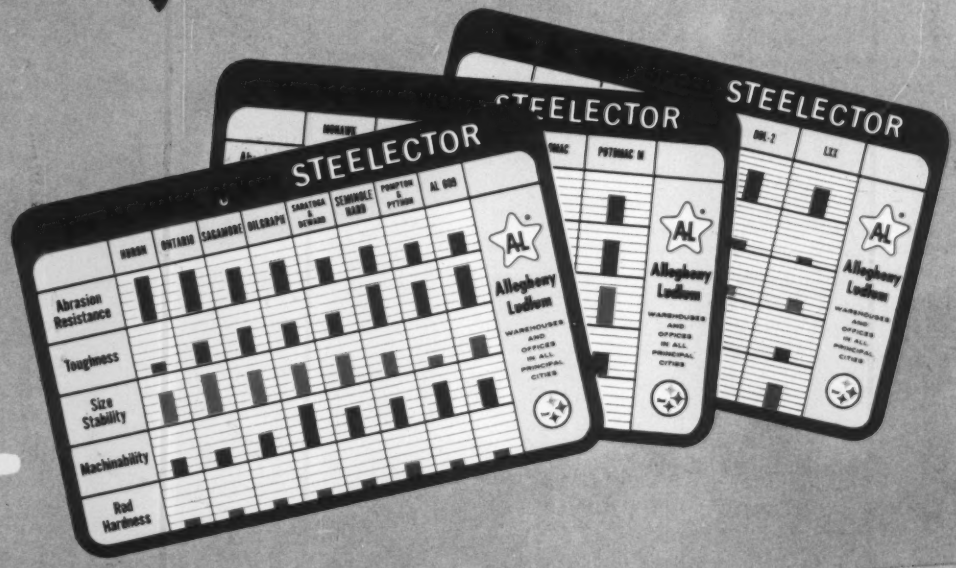
Make a Fast...Easy...Accurate Selection of

and know your size, shape, and grade are

The Allegheny Ludlum Tool Steel

STEELECTOR

- every type needed for 96% of all tool steel applications
- easy selection of the proper tool steel based on its individual characteristics
- stock shipment of grade and size assured at selection time



the Proper Tool Steel for any Application

Available with the A-L Steelector Program

easy answer to an old problem

Starting right now, the common problem of selecting the right tool steel for any job can become a thing of the past. With A-L's new STEELECTOR Program, you can make a *first time choice* of the proper grade for any application . . . and make it FAST, almost at a glance.

eliminates guesswork

The STEELECTOR is ACCURATE, eliminating guesswork, trial runs, and expensive mistakes. And best of all, the STEELECTOR gives you a choice of tool steels that are AVAILABLE . . . in stock, right now! And they'll *stay* available . . . with a new, increased stocking program. STEELECTOR Grades are stocked according to a study of today's needs and will be reviewed periodically to fit changing requirements.

here's how it works

In the new program, a STEELECTOR Card covering each group of steels (Tool Room, Hot Work, and High Speed Grades) will help you select one particular grade as the best for your application. The STEELECTOR presents five basic tool steel properties—Abrasion Resistance—Toughness—Size Stability—Machinability—Red Hardness—as bar graphs, with the length of the bar showing the extent of each property in every STEELECTOR Grade. Find the properties most important to you and, by inspection, pick the grade with the characteristics you need.

availability assured

There is a separate Data Stock List for each STEELECTOR Grade, showing its complete range of warehouse stocks, as well as technical

data and basic application information. So, you can be sure the grade, size, and shape of your choice is in stock.

quality assured

And you can count on Allegheny Ludlum quality in every STEELECTOR Grade. They are selected from the complete line of A-L Tool Steel and made under the rigid quality control standards of all A-L products.

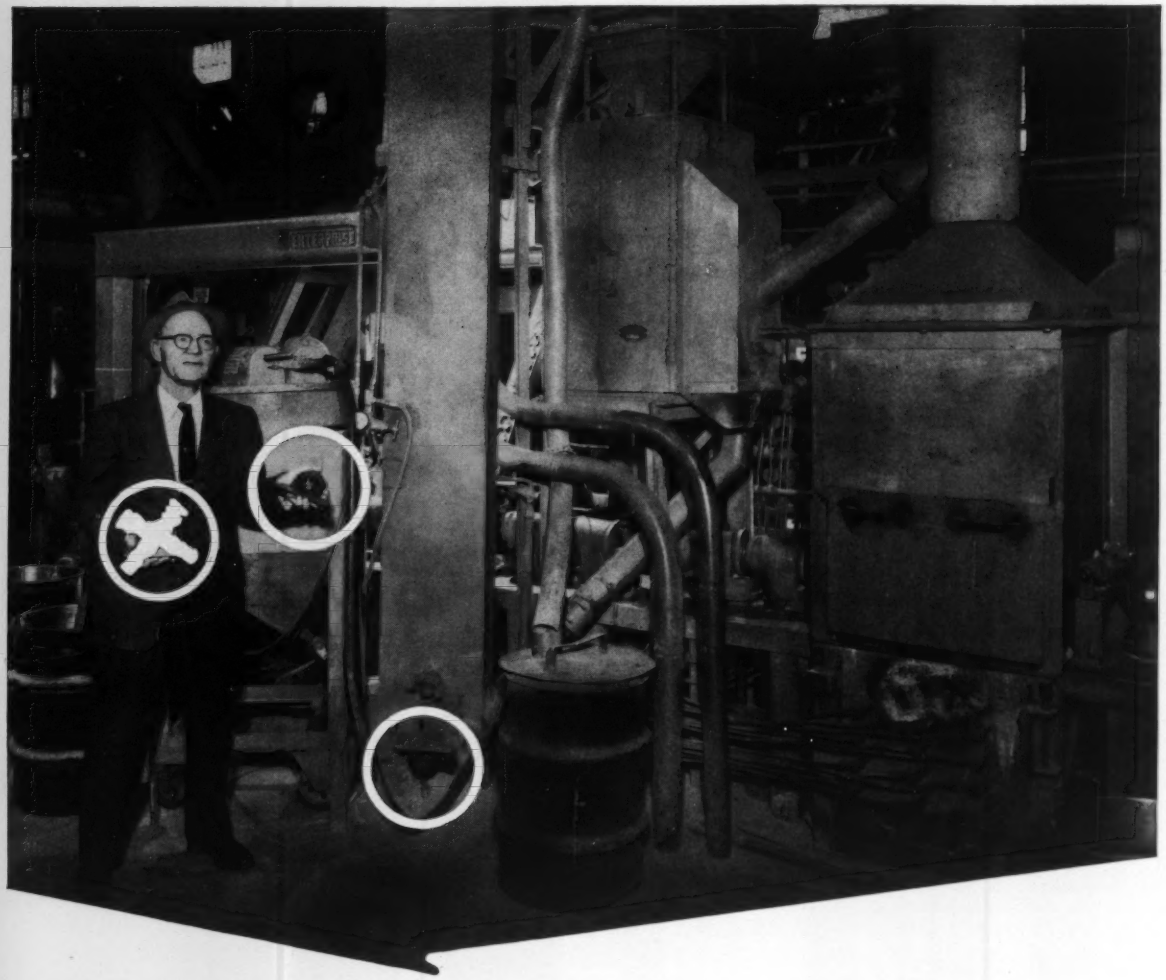
details available

It's all explained in the colorful A-L Tool Steel STEELECTOR Booklet, which includes STEELECTORS for the Tool Room Grades, Hot Work Grades, and High Speed Grades, and explains the Data Stock Lists for every STEELECTOR Grade. Ask your Allegheny Ludlum Sales Representative for your copy, or write: Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa. Address Dept. Ins. 7.

STEELECTOR PROGRAM

ALLEGHENY LUDLUM

Tool Steel warehouse stocks throughout the country



Bearings, Inc. recommended a better seal, a better bearing and savings are $700.00 a year!

Here's a maintenance foreman who knew where to get help when bearings in his care failed prematurely. He called a Bearings, Inc. engineer when the bearings in this bucket elevator conveyor failed after only two weeks of use.

The Bearings, Inc. engineer found that the powdered zinc transmitted by the conveyor was responsible for the failure. Powdered zinc had worked through the bearing seal and since zinc joins itself when rubbed between two surfaces, being rubbed between the balls and bearing race led to a build-up that stopped the bearings in their tracks.

Analysis of loads and speeds showed a less expensive bearing would work well if its seal would shut out all dirt. The original bearings cost $16.79 each — the replacement only $7.36! This meant a net saving of $700 in bearing costs alone. Now in operation for two years the bearings have been replaced only once.

Bearings, Inc. sales engineers sell only products we are authorized to sell. No deals, no "just as good as" substitutes. Call the branch nearest you — The bearings you want are in stock ready for delivery.

Providing bearing service in the North → **BEARINGS, INC.**

**A recent acquisition*

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Lockland • Mansfield • Painesville • Toledo • Youngstown Zanesville • **INDIANA:** Ft. Wayne • Indianapolis • Muncie • Terre Haute • **PENNSYLVANIA:** Erie • Johnstown • Philadelphia • Pittsburgh • York **WEST VIRGINIA:** Charleston • Huntington • Parkersburg • Wheeling • **NEW JERSEY:** Camden • Newark • **NEW YORK:** Balanrol Corp., Buffalo • Niagara Falls • **MARYLAND:** Baltimore • **DELAWARE:** Wilmington
***NEIMAN BEARINGS DIVISION,** St. Louis, Mo., E. St. Louis, Ill.

and

in the South → **DIXIE BEARINGS, INC.**

ARKANSAS: Little Rock • **FLORIDA:** Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge New Orleans • **N. CAROLINA:** Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville Memphis • Nashville • **VIRGINIA:** Norfolk • Richmond • Roanoke

(Continued from P. 118)

Philadelphia; and **Woodrow Wilson,** named Altoona plant manager.

Taft-Peirce Manufacturing Co.—**C. B. Klockars,** appointed asst. manager, machine tool sales.

Pittsburgh Steel Co.—**John Wais, Jr.,** named manager, Los Angeles district sales office.

Clark Equipment Co., Industrial Truck Div. — **J. L. Frost,** named district sales manager, northwest district.

New York & New Jersey Lubricant Co., Inc.—**Kenneth Burdon,** named Southern New England district sales manager.

Allis-Chalmers Mfg. Co., Industrial Equipment Div.—**G. A. Saar,** appointed general manager, Mechanical Depts., and **W. M. Terry, Jr.,** appointed general manager, Electrical Depts.

Traylor Engineering & Mfg. Div., Fuller Co. — **H. J. Petrie,** named sales manager, New York office.

Crucible Steel Co. of America—**R. J. Rand,** appointed manager, Pittsburgh sales branch; **D. R. Wistar,** named manager, Chicago branch, and **D. K. Stuart,** appointed staff assistant to the assistant general sales manager, field sales.

R. M. Wolcott, appointed director, Production Planning Programs, Jones & Laughlin Steel Corp.

Aluminum Co. of America — **J. A. McGowan,** appointed asst. general manager, field sales.

Edgcomb Steel & Aluminum Corp. — **Maurice Muser, Jr.,** appointed treasurer.

John Hazel, named asst. director, research, Republic Steel Corp.

Jones & Laughlin Steel Corp., Stainless and Strip Div.—**William Brenner, Jr.,** appointed service metallurgist, Louisville, O., plant; **Lowell Steinbrenner,** named de-

(Continued on P. 126)

"Inspected and Approved" is the symbol you need for work identification; heat treat; grade; codes; dates; analysis; tests; and inspection. You can speed production, too, with a controlled system.

Here's how to do it!

Issue your work inspectors a steel indenting stamp (available in series and symbols as well as trade-marks) and its matching acid-resisting etching stamp. A system can be set up especially for your needs.

New "Airgrit" INSPECTION GUN

Light-weight, portable blasting gun employs fine abrasive and rubber mask to produce a stress-free mark on surfaces which are highly polished or machined. Marks in 1/2 second.

Write for further information on the method you desire.

JAS. H. MATTHEWS & CO.

3962 Forbes St., Pittsburgh 13, Pa.

WARD STEEL CO.

PROMPT WAREHOUSE SERVICE ONLY

Most Complete Stock in America of

BLUE TEMPERED SPRING STEEL

We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand

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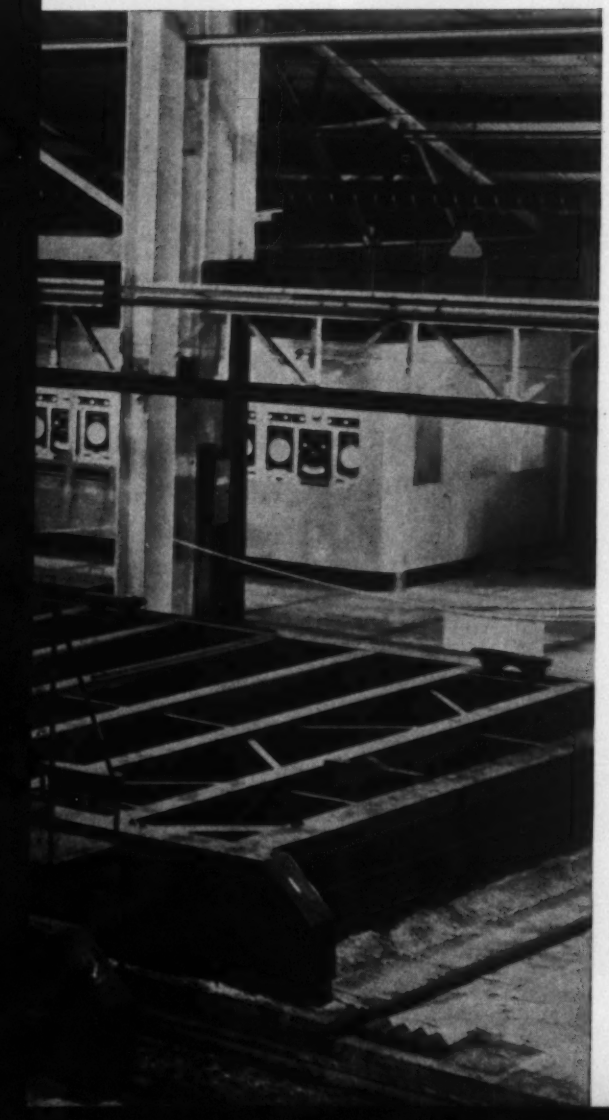
New control idea gives heating of soaking

At one of Canada's largest steel companies, a new idea in soaking pit controls permits independent selection of fuel for each pit. The operator uses high Btu fuel for cold steel, and simultaneously feeds less expensive gases to pits that are just holding a heat. He uses only the gas he needs to get the heat he wants. Also, he gets closer control of pit temperature than ever before possible, and ideal protective atmospheres. Your nearby Honeywell field engineer is ready to help you get these advantages in your soaking pit operations. Call him today, he's as near as your phone. MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa. In Canada, Honeywell Controls, Ltd., Toronto 17.

you flexible, economical pits



Controls like these give flexible and economic heating of 12 thirty-ton capacity soaking pits, permit independent selection of fuel (coke oven gas, blast furnace gas, or a mixture) for each pit, maintain within each pit the turbulent flows necessary for good soaking and top-to-bottom temperature uniformity, and help provide the best possible protective furnace atmospheres. Protective devices built into the system automatically safeguard against failure of power, fuel or compressed air. Stack dampers can be raised manually, even while under automatic control. The system also closes dampers, cuts out combustion air, and reduces gas flow automatically when the covers open.

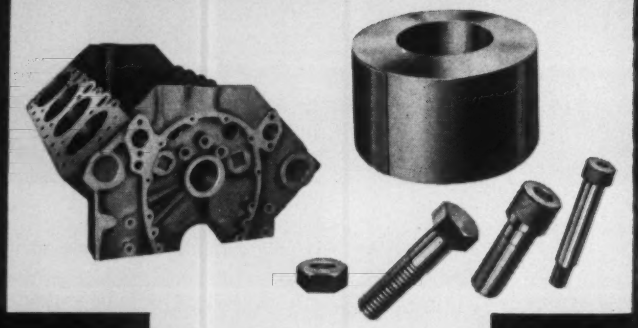
75th YEAR
PIONEERING THE FUTURE

Honeywell

First in Control

SINCE 1885

VALVOLINE
Tectyl
protects metals against RUST



VALVOLINE'S amazing Tectyl rust preventives protect metal surfaces against *rust and corrosion* during storage and shipping.

Low-cost Tectyl compounds are easy to apply by brush, spray or dip and just as easy to remove. They protect metal surfaces against the effects of snow and rain... salt air, humidity, perspiration and corrosive fumes.

Tectyl rust preventives meet exacting government specifications.

Write today for these two helpful Tectyl charts

1. "Valvoline Tectyl U. S. Government Approved Packaging and Preservative Chart." Gives the Army, Navy, Air Force and other Government Agencies' specifications and applications.

2. "Valvoline Tectyl Industrial Rust Preventive Comparison Chart." Specifies applications covering the industrial field.

VALVOLINE Tectyl RUST PREVENTIVES

(Continued from P. 123)

velopment engineer, Youngstown and Louisville, O., plants.

Republic Steel Corp. — **S. J. Marcus,** named asst. sales manager, Cleveland district; **C. A. Porter,** appointed chairman, company-wide blooming mill committee.

Jack J. Kerns, appointed director, purchasing, Selas Corp. of America, Dresher, Pa.

R. G. Schneider, appointed manager, engine lathe sales, R. K. LeBlond Machine Tool Co. of Cincinnati.

Morse Twist Drill & Machine Co. — **J. J. Devlin,** appointed sales representative, northern New Jersey-Rockland and Dutchess Counties. N. Y., area.

OBITUARIES

A. G. Sturrock, chief metallurgist, Wyckoff Steel Co., Pittsburgh.

R. J. Kraemer, 64, vice president and director, purchases, The R. C. Mahon Co., Detroit.

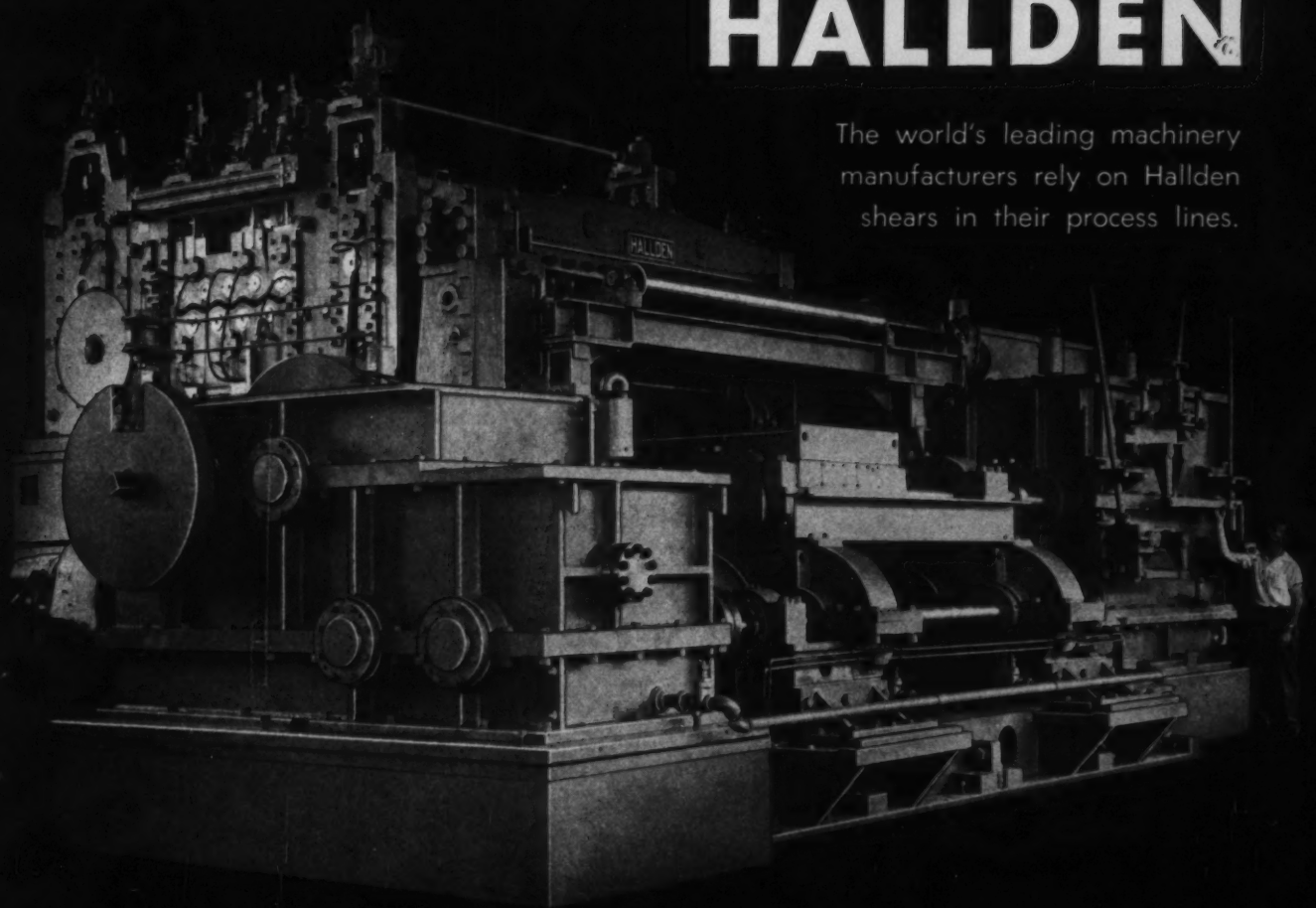
550,000 POUNDS OF PRECISION

The Guillotine Shear's superior cut on heavy gauges, synchronized on the fly

Another Hällden First — type 76 Guillotine Flying Shear, the world's largest, for continuous strip shearing — up to 5/8" thick, 100" wide aluminum — at ***two cuts per second.*** This new Hallden installation can cut mild steel up to 3/8" thick and 90" wide, with cut lengths infinitely variable up to 48 feet. Change of cut length and synchronization may be made while the Shear is in operation. For every high-production shearing application consult the shearing specialists.

HALLDEN

The world's leading machinery manufacturers rely on Hallden shears in their process lines.



THE HALLDEN MACHINE COMPANY • THOMASTON, CONNECTICUT

Associates: The W. H. A. Robertson & Co., Ltd., Bedford, England

Aluminum makes freight cars bigger -without increasing their size!

Strong, Lightweight Reynolds Aluminum Increases Payload, Cuts Dead Weight, Reduces Maintenance

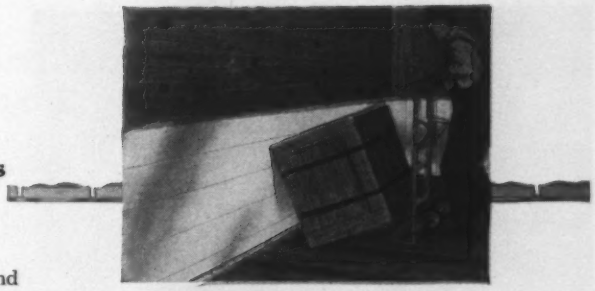
Now rolling on American railroads: hopper and gondola cars that can carry more than 100 tons of payload within rail weight limits! They have bodies made with strong, lightweight Reynolds Aluminum . . . and they can carry 5 to 10 tons *more payload* than comparable steel cars.

The reason for this dramatic improvement is, of course, the ability of aluminum to cut dead weight. It weighs only about ⅓ as much as steel, yet it is rugged enough to take the roughest railroad duty. The cars' aluminum side sheets are expected to outlast ordinary steel construction.

Increased payload and longer service aren't the only benefits aluminum will bring to the railroads. These new cars will serve longer with less upkeep. Aluminum never needs protective painting, and it can handle even corrosive cargoes with a minimum of maintenance.

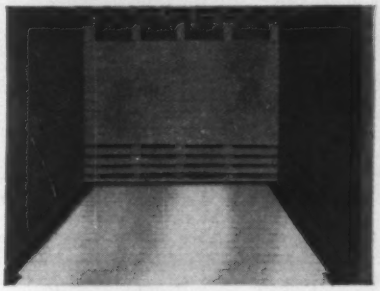
Although these 1,200 hopper and gondola cars made with Reynolds Aluminum are a big breakthrough in the use of aluminum for rolling stock, the metal is by no means new to railroad men. For years, it has been cutting costs, lengthening service life in passenger cars, tank cars, signs, and railyard equipment. Box car doors, inner-liners, refrigerator car floors, floor racks and doors are also in service on leading railroads.

The transportation industry is just one of many where aluminum's light weight, strength, and freedom from harmful rust mean important savings and product improvements. For details on how Reynolds Aluminum can help your product or production, write *Reynolds Metals Company, P.O. Box 2346-GN, Richmond 18, Virginia.*



Inner-liners of strong, rustfree Reynolds Aluminum increase freight car life, cut maintenance and repairs.

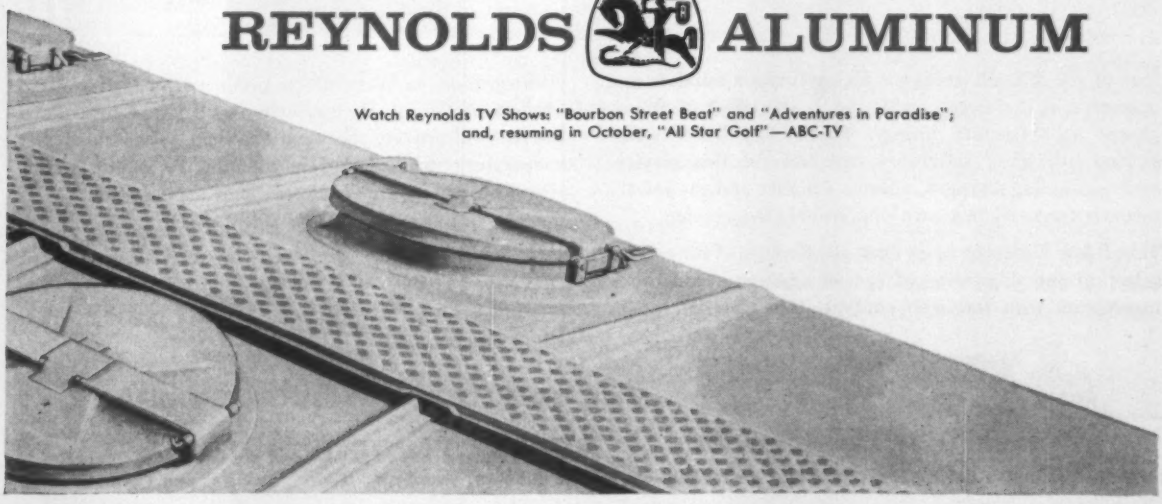
Crossmembers made of rugged Reynolds Aluminum weigh approximately half as much as ordinary types, ease handling.



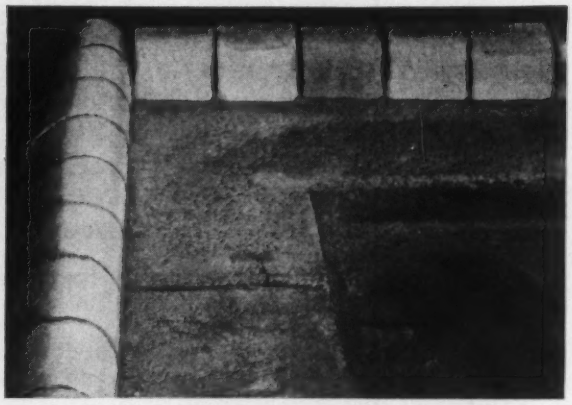
Refrigerator car floors made of Reynolds Aluminum outlast three wood installations, won't rust or rot, are easy to clean.

REYNOLDS ALUMINUM

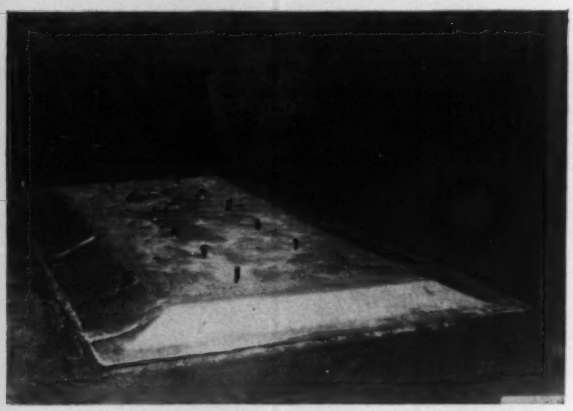
Watch Reynolds TV Shows: "Bourbon Street Beat" and "Adventures in Paradise"; and, resuming in October, "All Star Golf"—ABC-TV



B&W Kaocrete-D, vibrated in place, provides high resistance to the atmospheres encountered in this coke oven door installation. Furthermore, the high erosion resistance and long service life without loss of strength of B&W Kaocrete-D add to its suitability in this application.



A typical monolithic curb wall construction in an annealing furnace using a carbon monoxide atmosphere. The greatly reduced number of joints in which sealing sand can penetrate prevents structural spalling of B&W Kaocrete-A upon heating and cooling. Being monolithic, gas leaks are practically eliminated.



A radiant tube annealing furnace with a base of Kaocrete-A, backed up with Kaolite-20, one of B&W's insulating refractory castables. This furnace operates at approximately 1700 F in a 65% CO atmosphere.

A stack annealing furnace with pedestals cast of B&W Kaocrete-A. The atmosphere is slightly above 8% CO. B&W Kaocrete-A offers strength, volume stability and resistance to carbon monoxide disintegration.

How B&W refractory castables perform in atmosphere applications

One of the difficult problems facing furnace builders and operators in the metals industries is the effect of atmospheres on refractory linings. That's why B&W offers several *specialized* refractory castables for this service, each possessing strength, volume stability and the refractoriness necessary to assure long, trouble-free service.

Take B&W Kaocrete-A, for example. Because of the careful selection and processing of special aggregates and other ingredients with low iron content, this material resists disintegration or other effects produced by high concentrations of CO or H_2 atmospheres. B&W Kaocast and Kaocrete-32 provide the same excellent service at higher temperatures while lightweight Kaolite-20 is outstanding as an insulating castable in atmosphere applications.

B&W Bulletin R-35A gives additional information on versatile B&W refractory castables. Write for your copy of this bulletin to The Babcock & Wilcox Company, 161 East 42nd Street, New York 17, N. Y.

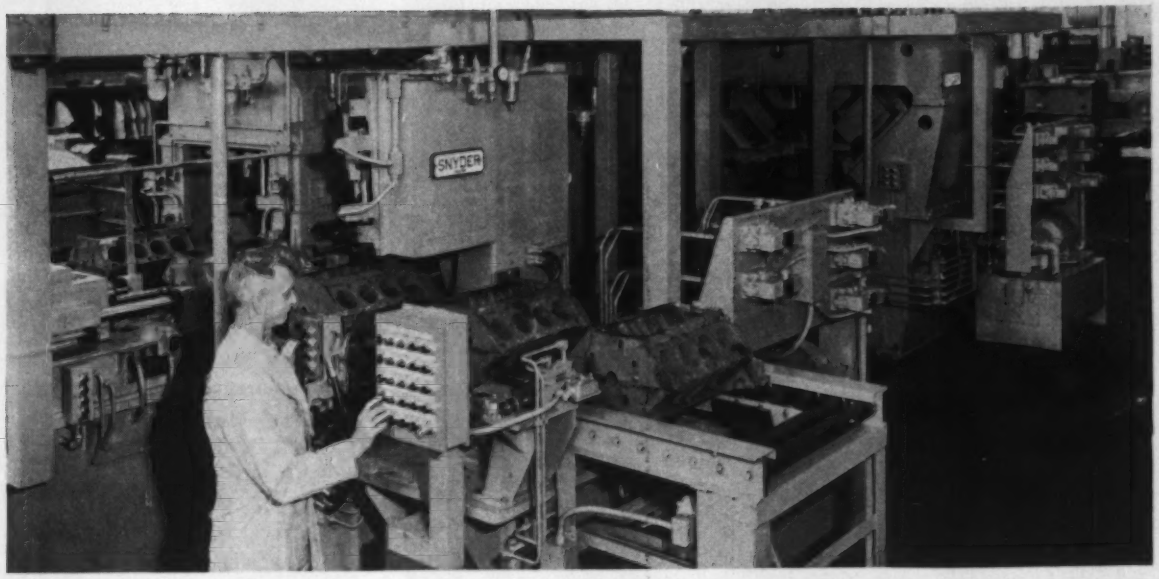
R832

B&W

THE BABCOCK & WILCOX COMPANY

REFRACTORIES DIVISION

B&W Firebrick, Insulating Firebrick, and Refractory Castables, Plastics, Ramming Mixes, Mortars, and Ceramic Fiber.



CONTROL POINT: Overall view of automatic transfer machine shows where parts are loaded for de-finning.

New Machine De-fins Castings To Boost Foundry Output

Traditional hand methods have piled up many cost problems for foundries.

Now a completely mechanized installation is smashing one of the worst: chipping and grinding of casting fins with hand tools.

By R. H. Eshelman,
Machinery Editor

▪ Soon, the first automated de-finning installation will go into action. When it does, it will be the end of one of the most troublesome hand-labor jobs in the foundry.

Chipping and snagging castings by hand is costly and time-consuming. Such operations impose a big price penalty on a production process.

Development of automatic methods for removing fins from cored holes and recesses of intricate castings is a big breakthrough. Now, there's a transfer line designed to handle V-8 engine blocks on a high-volume basis. It's being installed at the Central Foundry Div., General Motors Corp., at Defiance, O.

Tried and Tested—The machine has come through shakedown runs with flying colors. It has undergone numerous pilot runs at Snyder Corp., Detroit, designer and builder of the special machine.

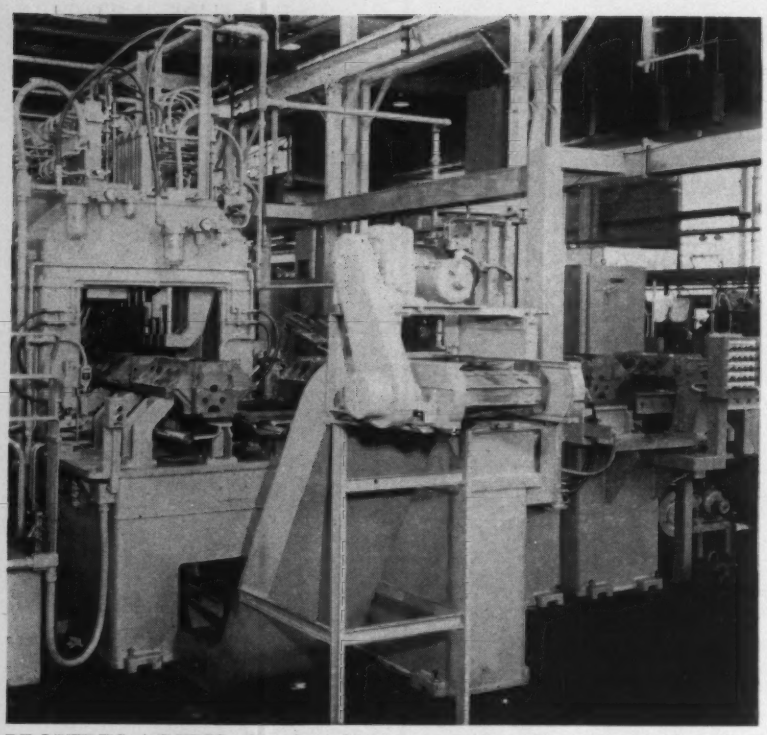
The company president, H. N. Maynard reports it is designed to de-fin 240 engine block castings per hour (at 100 pct efficiency). Until now, even the more progressive shops use air hammers to knock off the excess material.

Adds a Step—In standard-production processing, castings come in from the shakeout. Then they are tumbled, rough ground in an automatic machine, and shot blasted. They then pass through an impact turnover and are ready for the manual de-finning.

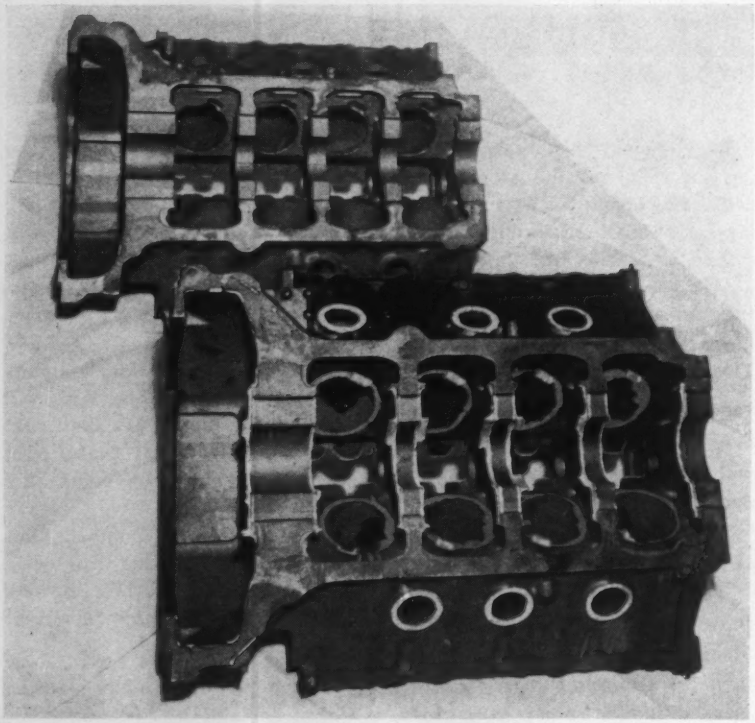
With the new transfer de-finning line, the first processing steps will be the same—up to shot blast. But now de-finning takes place right after rough grinding and before shot blasting.

The reason? By removing fins first, the shot blasting can be a more effective step. Thus, the new process procedure pays a double bonus.

Tough Nut for Builder—Snyder Corp., explains Mr. Maynard, did not attack this tough technical nut blindly. Even before making up a



PROVIDES ACCESS: Cast-iron blocks move from first to second section by dogleg transfer. This design gives access to both sides and ends.



BEFORE AND AFTER: Compare cast iron engine block castings before (bottom) and after (top) processing. White areas show stock to be removed.

machine proposal, company engineers tried various setups to find out if automatic techniques would work.

They studied the feasibility of mechanizing punch and air-hammer chipping. A combination of both was also tried.

They found that a combination of both methods would probably be needed to do the job automatically in a programmed sequence. That's because of much variation in thickness of fins.

Takes Experience—Nevertheless, they would never have dared tackle the forbidding job, Mr. Maynard confesses, without a backlog of experience in designing and building transfer-type machine tools over the years.

He explains: "We have found that for mass-production metal-cutting lines, the transfer machine is an economical and dependable production tool." And, he adds, "We could see no reason that these concepts could not be applied to other production problems — such as those found in the foundry industry."

How It Works—The de-finning unit is really a 13-station line with a right-angle dogleg. It is divided into three parts to allow adequate room between machine elements for operators to remove tools. Also, it gives access for maintenance people. The dogleg segment at the beginning of the line allows working on each end of the block.

Parts move from station to station, on fixed hardened rails. They are propelled by a rotating-finger transfer mechanism. After the machine punches fins from end holes in the first three stations, the blocks transfer at right angles.

As blocks move down the second section, top and side holes are definned. Finally the blocks move crosswise into a turnover. This rotates them 180° (upside down). In this last section of the machine, bottom and side areas are definned.

To hold cycle-time down, the

second and third sections de-fin while the first section transfers. And transfer into the second station and intermediate turnover occur while the first section defins.

Design Problems—Prime goal of the planning and development work was to assure that tools and processes chosen work under practical operating conditions. So reports Leo Gajda, Snyder Corp.'s director of engineering.

For instance, where an experiment shows that a punching operation can remove a fin, this method is specified. But some fins could not be removed by punching. Then, tests were made with hand-operated air hammers.

Both punching and chipping operations are powered by air. The builder installed a special air-compressor on the assembly floor for tryout. Hydraulic power is used only to index the parts and operate locators.

Uses Special Steels—Tools for punching are hardened, round, steel punches with special face shapes. Punching is by an impact stroke with the weighted unit actuated by an air cylinder.

Chipping stations use special hardened-steel form tools. Shanks fit into standard air-hammer units. Heads with chipping assemblies advance to contact the casting fins. The hammers work for a set time.

If the fin is not removed in the cycle time, head travel stops; the unit retracts. A memory unit records where the incomplete step occurred. When the block ejects from the machine, a marking unit stamps it as a reject. The unfinished operation then can be finished by hand.

An automatic conveyor system is built into the transfer line. It carries broken fins and chips out of the machine.

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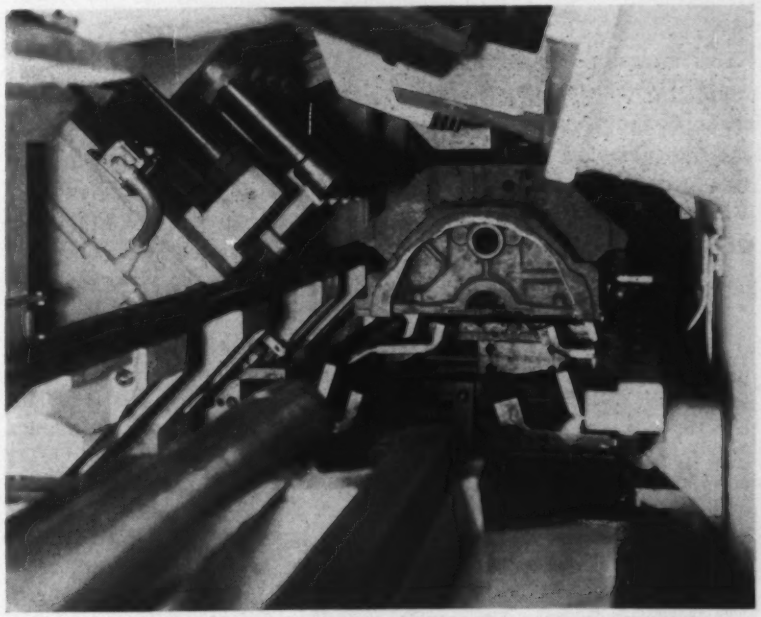
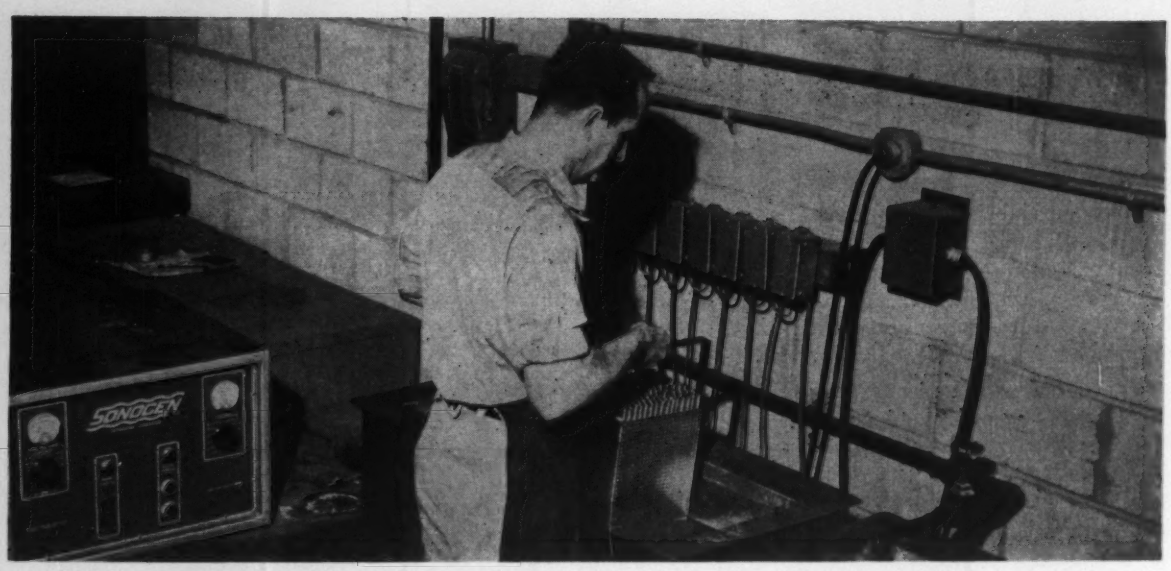
Steps to De-Fin Engine Block

Station	Unit	Operation
1		Load on transfer rail
2	Single-spindle vertical punch unit	Punch fin from distributor hole
	Single-unit chipper	Chip fin from oil filter pad
3	Five-spindle horizontal punch unit	Punch fins from camshaft hole, water jacket holes, oil return holes
	Two-spindle horizontal punch unit	Punch fin from camshaft hole and cam chamber breather hole
4		Transfer part at right angles
5	Four-unit vertical chipper	Chip fin off tappet bosses
6	Four-spindle angular punch unit	Punch fin from cylinder bores
	Four-unit angular chipper	Chip fin around tappet bosses
7	Four-unit angular chipper	Chip fin around tappet bosses
	Four-spindle angular punch unit	Punch fin from cylinder bores
8	One-unit angular chipper	Chip fin from tappet bosses
9		Turn part over 180°
10	Three-spindle angular punch unit	Punch fin from welch plug holes
	Four-unit vertical chipper	Chip fin from crank bearing holes
	Three-spindle angular punch unit	Punch fin from welch plug holes
11	Five-unit vertical chipper	Chip fin from crank bearing ribs
12		Mark reject parts
13		Unload part



CHIPS AND PUNCHES: Left hand units punch fins from cylinder bores as block nears Station 6. Upper units chip fins around tappet bosses.



MINUTE CLEANING: After sawing, tubing is immersed in solution of Oakite 33, and is cleaned in 60 seconds.

Stainless Tubing Gets Dip In Ultrasonic Bath

By **S. Rubenstein**—Project Engineer, Resistoflex Corp., Roseland, N. J.

The ultrasonic wave motion, set up in the cleaning solution, increases the physical and chemical soil-removing action of the cleaning solution.

One of the many advantages of ultrasonics is its drastic reduction of cleaning time.

▪ There is no margin for error in the manufacture of bent-tube assemblies for fuel and hydraulic systems in supersonic aircraft. Parts must conform to tight design specs, and they must be free of foreign matter. Ultrasonic cleaning guarantees the cleanliness required.

Cleaning is a continuous process at Resistoflex Corp. A Sonogen unit, made by Branson Ultrasonics Corp., Stamford, Conn., provides high-speed ultrasonic cleaning. It consists of a 1-kw generator, which supplies energy; and a stainless-steel solution tank—fitted with eight transducers mounted on one side.

The tank is about 36 x 18 x 24 in., and holds 40 gal of solution. Electrical heaters mounted under the tank keep the solution's temperature at 160°F.

Economical Concentration — A non-toxic solution produces safe, powerful ultrasonic cleaning. This acid-detergent cleaner consists of a 7- to 10-pct concentration of Oakite 33, made by Oakite Products, Inc., New York.

Length of immersion time in the solution varies with the soils to be removed. About 60 seconds is generally sufficient.

Tubing is placed vertically in a perforated stainless-steel basket, and lowered into the solution tank. It is placed vertically because the path of sound waves is perpendicular to the face of the transducers. Contamination from inside the tube can then fall to the bottom of the tank.

Quick Drying — After removal from the solution tank, parts are drained. Then they receive a rinse in boiling water. This removes the dissolved soils and residual solution. The high temperature of the rinse water speeds drying. A blow-down with compressed air completes the job.

The concentration of cleaning compound is low. Consequently, the solution is inexpensive. Here's one of the advantages of ultrasonic cleaning—it boosts the cleaning power of a solution by vigorous agitation.

Increases Removal Action—The transducers convert high-frequency sound waves into mechanical energy. The solution becomes a foaming sea of bubbles that constantly form and collapse. The collapse of the bubbles, at the surface of the object being cleaned, literally rips the soil off the surface.

The method is fast; it removes all the soils; and it's completely safe. Because immersion time is so short, both steel and aluminum can be cleaned in the same solution—it is not necessary to have separate tanks, as it would be when other cleaning methods are used.

Processing at Resistoflex Corp. starts with stainless-steel tubing, all 300 series. First the tubing is cut to the proper length by an abrasive saw. This operation sets up a magnetic attraction between the fine metal dust and the tubing. Particles must be removed before bending, or they would cause draw lines in the tube. Draw lines would weaken the tubing wall and lead to failure in service.

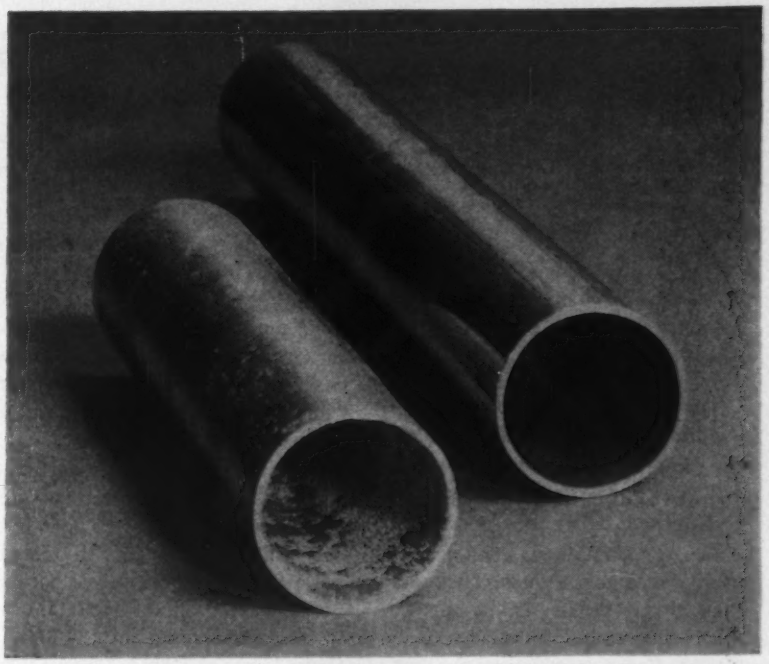
A Fast Break—It was impossible to remove these particles by any mechanical means or by vapor degreasing. A 60-second soak in the ultrasonic tank breaks the magnetic attraction and floats the filings off completely.

After sawing, parts are mechanically deburred, and given another 60-second dip in the ultrasonic tank. This again removes the fine particles before the bending operation.

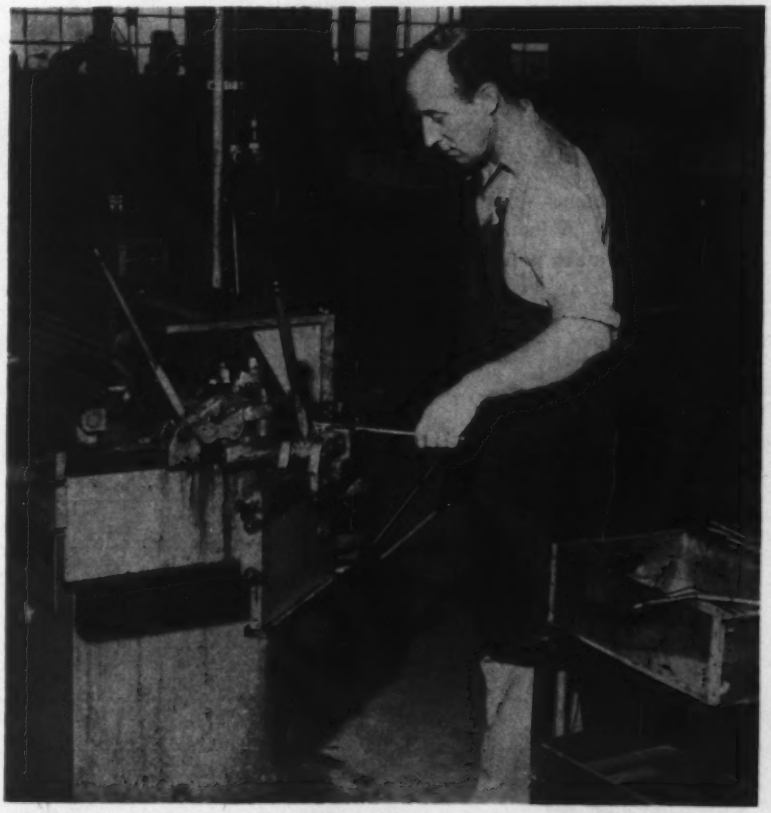
The tubing is then run onto a mandrel and placed in dies for the bending operation. After bending, the tube is trim cut and deburred. Then the part is again given an ultrasonic dip. It is then ready for welding or brazing.

The use of Oakite 33 leaves the metal so thoroughly clean that the brazing alloy has better and more complete wetting-out action.

After brazing, the residual flux is removed by immersion in the ultrasonic cleaning bath. A light heat discoloration from welding is also removed in this manner.



BEFORE AND AFTER: Stainless tubing on left has just come from abrasive sawing. Tubing on right shows thoroughness of ultrasonic cleaning.



TUBE BENDING: Bent tubing must be clean, free of steel particles, which would create draw lines during bending operation. The tubing is then trim cut and deburred. Final operation is an ultrasonic dip.

Ratio Analysis: A System That Controls Production Profits

By S. A. Tucker—Partner, Martin & Tucker, Little Neck, N. Y.

Sound analysis plays a vital role in predicting profits.

The day has passed when a production manager was able to make safe judgments from data available at his finger tips.

■ Today, people have great control over what concerns them. They take pills to stay awake. Other pills induce sleep. Still others alter body weight. Some even improve a person's memory.

But no one has invented a pill that produces optimum and consistent profits. There are no pills on the market to insure sound economic growth patterns. If such pills were available they would simplify the problems of effective management.

Fringe Problems—The day has passed when a production manager was able to make safe judgments from the facts at his finger tips, Those days are gone for good. Now the harvesting of profits depends on fringe areas. Many of these areas elude management.

This is especially true when the focus is on the end result—"net profit." Many rich losses float in a net-profit stew. Imagine the potential profits in a company that reports a net profit of $150,000 — with gross profits of $750,000. Gross losses of $600,000 leave a lot to be desired.

Operation of a successful business depends upon sound management decisions. These decisions must often be made quickly. Therefore meaningful data is essential.

Use Sound Analysis—To come up with firm answers, management has to integrate data that produces optimum and consistent results. How? Sound analysis — and not instinctive ability—provides the key to making the best of available facts and figures.

A managerial-controls (or MC) technique is the tool to use for swift, secure and objective action. MC gives management economically-weighted data.

Evaluation of efforts, performances, expenses and other factors are done by means of ratios. As a ratio value changes, so does the evaluation of the area defined by that ratio.

But how does this ratio-change affect other areas? The answer has to be found. Many segments of a company's operations are related to various ratios over a period of time. Proper evaluation determines valid trends.

Plan Program — Where do you start? Construct ratios of the data typical to most of your factory operations. Organize these ratios in fixed forms. Investigate proper time and output reports from production. Analyze payroll data. Check statistics on shipments and rejects.

Most of these data stand alone. Therefore, they're called primary or unrelated data. A sample of the

PLANNED PROFITS

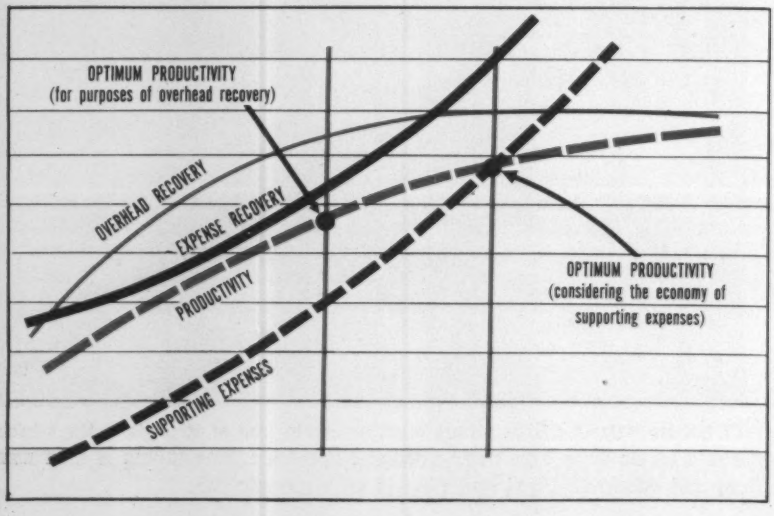
This is the second of a four-part series of articles on planned profits.

Last week's article discussed controls for management.

Next week, Mr. Tucker will take up the subject of evaluation and control of sales.

The final article will cover control of capital evaluation.

Determine Optimum Production



data extracted from a payroll analysis appears in table form.

A number of elementary ratios can be constructed from these data. Example ratios appear in the second table. These ratios serve in the grass-roots evaluation of a production effort.

Elementary ratios are a vital MC tool. Two or more unrelated pieces of current data each receive economic meaning from the presence of the other.

Wage Incentive?—Ratio V provides a case in point. This ratio relates the net earned hours to the total payroll hours. Result? Firm appraisal of the "productivity economy" on the total payroll.

This ratio proves useful for checking the value that a wage incentive plan makes to the factory payroll. It does this work without any direct-labor influence.

The ratio evaluates the economic balance between net productivity and the level of indirect labor supporting it. How? If the value of this ratio remains the same with increases in net productivity and incentive coverage, it's the result of an increase in indirect labor. This boosts the entire payroll.

Ratio VI compares "lost" hours with "gained" hours. It shows by what quantity of hours the workers fail to earn their task. It also relates the number of extra paid hours the workers receive by exceeding their task.

Erratic Pace—What if workers fail to reach a normal pace—then exceed the pace—with the same week? There are only two answers. The workers may be inconsistently applying their efforts. Or the work standards aren't uniform.

As subsidy hours decrease, in a healthy situation—where workers make proper effort on fair work standards—premium hours increase. This is important. The direction which a new incentive plan takes can be evaluated by use of this control.

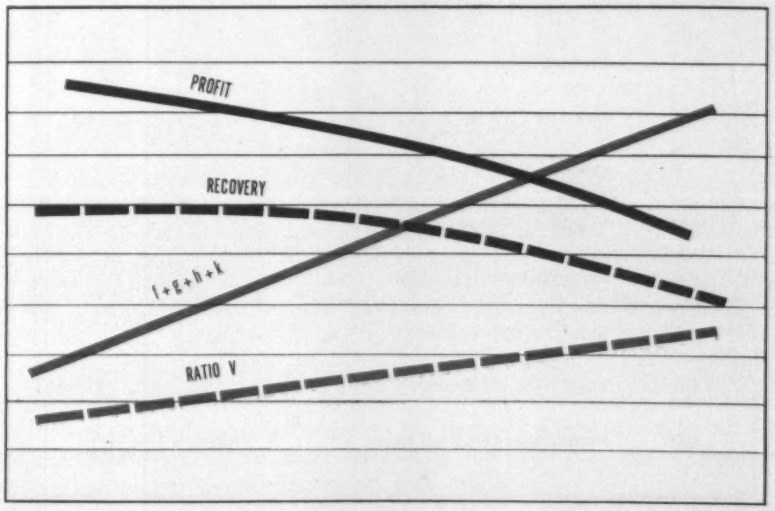
A table presents statistical pro-

Construct Elementary Ratios

DATA TABULATED	CODE IN RATIO Dollars	Hours
Gross Payroll	1	15
Direct Labor:		
On Standard—Earned	2	16
On Standard—Clock	3	17
Off Standard—Clock	4	18
Total Direct Labor	5	19
Indirect Labor:		
Downtime	6	20
Excess Direct Labor	7	21
Maintenance and Repairs	8	22
Salvage and Rework	9	23
Service	10	24
Total Indirect Labor	11	25
Direct-Labor Subsidy (Lost)	12	26
Direct-Incentive Premium (Gained)	13	27
Indirect-Incentive Premium	14	28

RATIO NUMBER	TITLE	FORMULA
I	Gross Productivity Ratio	$\frac{16}{17}$
II	Net Productivity Ratio	$\frac{17 - 26 + 27}{17}$
IV	Performance Index	$\frac{17 - 26 + 27}{19}$
V	Improvement Index	$\frac{17 - 26 + 27}{24}$
VI	Worker-Standards Consistency Ratio	$\frac{26}{27}$
XII	Excess Cost Ratio	$\frac{6 + 7 + 9 + 12}{5}$
XXXI	Effective Maintenance Index	$\frac{22}{16}$
XXXII	Productivity Planning Index	$\frac{13}{6}$

Are Improvements Justified?



duction data. These data relate to production — but exclude factory labor. More advanced ratios, based on the statistical data appear in the final table. These ratios are called tertiary ratios. They are used by upper managerial levels to get broader control.

Prevent Abuse — For example consider ratio J. This control evaluates a productivity surge in terms of the damage it may do to machinery, materials and products. What if the ratio-value develops a steady decrease? This indicates that equipment, materials and products are being abused for the sake of higher incentive premiums.

Ratio P gives a closer look at the burdens imposed on the direct-labor effort. This ratio shows the return of each productive hour that the company must get to break-even.

You could say this ratio evaluates "profit elasticity." It checks the ease of profit-making and the range of sales over which profits can be made.

Ratio LL is a vital control in industries with high fixed-investment costs. This is true of many companies. Especially those in the business of selling their machine and/or plant time.

Recover Outlays—Besides showing the amount of total overhead which the company must spend to support it, this ratio shows the speed with which outlays are recovered. This integrates the results of sales efforts. It shows how these efforts support production economy. It also indicates the upward or downward movement of the company's break-even point.

Management must see the effects of individual events and area movements in the total economy of the company. This is best illustrated by simple charts.

The charts are made up of curves that move in response to minute happenings. From these charts, management can broadly diagnose both meanings and impacts.

Typical relationships between productivity, supporting expenses and overhead recovery can be plotted. A point is reached in the climb of productivity where it becomes uneconomical.

Above this point, the magnitude of the indirect labor used offsets the gains of the higher productivity. Why? Because materials handlers, set-up men, maintenance services and more inspectors are needed. And waste and rejects climb.

Individual Patterns — Optimum productivity should be determined in each locale. As productivity rises, it accelerates fixed-expense recovery. Productivity increases—and their changes at higher levels—alter the rising slope of the recovery curve. This may or may not coincide with that of the productivity curve.

As the first chart shows, optimum productivity — for purposes of economical overhead recovery — occurs prior to optimum general-expense productivity. This isn't true with all companies. It depicts a specific local condition.

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Check Tertiary Work Ratios

DATA TABULATED	CODE IN RATIO
Manufacturing Occupancy	a
Shipments (adjusted for overlap)	b
Machinery Repair Parts and Labor (outside)	c
Dollar Value of Waste Produced in Plant	d
Cost of Returns Rejected from Customers	e
Total Machinery Depreciation in Period	f
Sales, General and Administrative Payroll	g
Total Non-Labor Overhead Expenses in Period	h
Machinery Running Hours	j
Fixed Expense Segment of Total Overhead	k

RATIO NUMBER	TITLE	FORMULA
F	Non-Labor Expense	$\frac{b}{h}$
G	Machinery Economy	$\frac{6+7+8+c}{f}$
J	Productivity-Economy	$\frac{28}{8+9+d}$
M	Incentive Economy	$\frac{13}{7+8+9+12+14+d+e}$
P	Productive Load	$\frac{g+h+(1-5)}{19}$
MM	Machinery Hourly Cost	$\frac{6+7+8+c}{j}$
AA	Performance-Excess Index	$\frac{\text{Ratio IV}}{\text{Ratio XII}}$
LL	Overhead Activity Index	$\left(\frac{10}{5}+\frac{g}{5}+\frac{h}{5}\right) \div j$
OO	Fixed Recovery Return	$\frac{b}{19}\left(\frac{j}{20+21+22+23+24}\right)$
QQ	Performance-Overhead Index	$\text{Ratio IV}\left(\frac{16}{g+h}\right)$

Duplex Mill Keys Motor Shafts

Very often, cutting operations are combined to gain accuracy in location as well as to save time.

This versatile duplex half-mill might be just the unit to cut your setup time.

■ Duplex half-mills combine cutting operations and place a saving on time and labor. The machines are capable of slotting, sawing and face and slab milling.

The unit forged into the motor making industry by cutting keyways in double end gear motor shafts. It holds very close tolerances in alignment on both shafts. The chance for error is eliminated.

U. S. Burke Machine Tool Company, Cincinnati, designed the unit to improve assembly time and accuracy by automatically milling two keyways at the same time. It is well to note that the operation is performed after the motors are completely assembled.

Double Duty—Equipped with 4-in. stroke air-hydraulic head feed and electrical limit switches, the duplex half-mill cycles and shuts off automatically. One right and one left-hand half-mill are installed facing each other to comprise the duplex machine. Spacing is designed for accurate location of the double-end gear motor between the two units.

The operator simply slides an assembled gear motor from the assembly line into the holding fixture, locating each of the two shafts in angle blocks. He quickly clamps them in position and trips a switch.

The milling heads rapid traverse down, feed to depth in both shaft extensions. Rapid traverse is made back to start position, and the unit automatically shuts off. Interlocking limit switches control the vertical stroke of the air hydraulic heads.

For sensitive vertical movement, the head and motor of each unit are balanced on a common bearing supported pivoting arm. The motor bracket swivels to facilitate belt changing. A steel guard hinged on top permits additional convenience and safety.

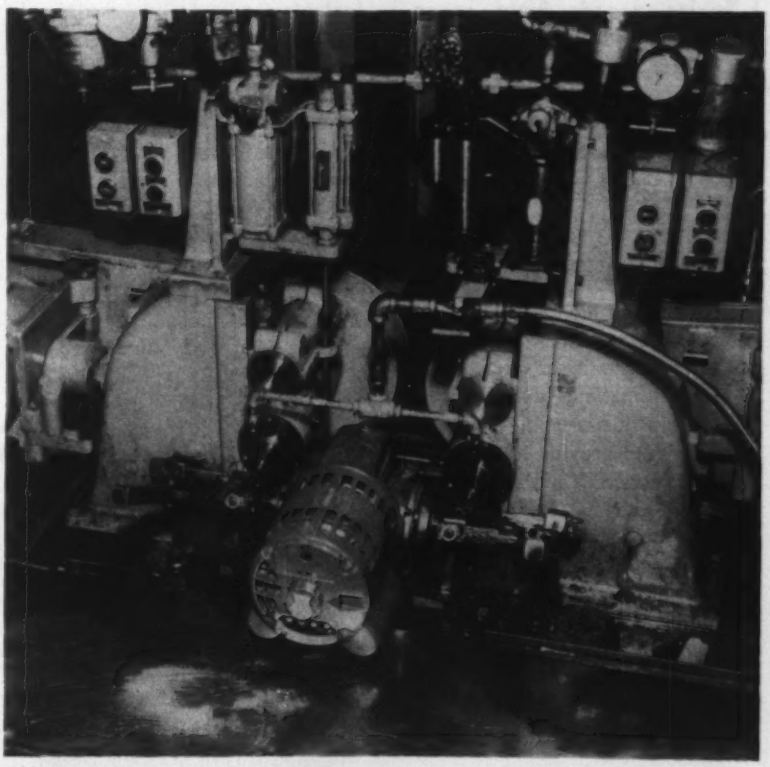
Time Saver—Actual milling time is only .37 seconds. Surface speed of the cutters is 95 fpm, with feed rate of 2¼ ipm.

The duplex half-mill runs at a spindle speed of 360 rpm for the operations. Curved tooth cutters are utilized for the keywaying. Chips are removed after each cut by two hoses connected to an industrial vacuum cleaner.

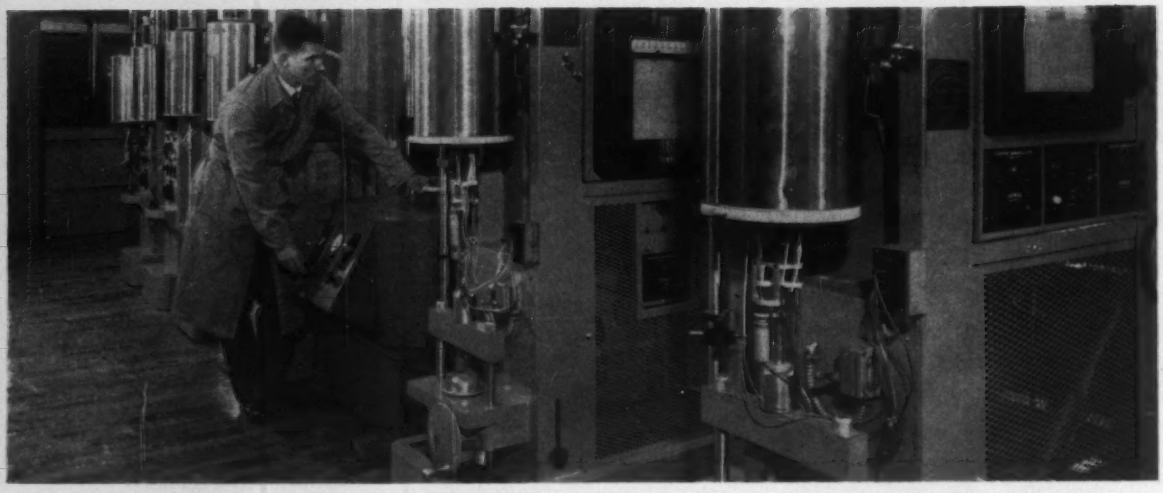
Rejects, which would be extremely costly at such a late stage, are greatly reduced since the two keys are milled simultaneously in one accurate line.

There is no chance for error, as might be the case if the shafts were positioned for two separate milling operations where re-alignment would be required. Time and labor are obviously decreased.

Other Uses—The machines are also capable of slotting, sawing, face milling and slab milling. The unique flexibility of the compact half-mills, permits many applications other than duplex mounting. The units can be used singly on a standard base with integral coolant reservoir and collecting area.



TWIN CUT—Duplex half-mills key the shafts on a double end motor. The unit motors are scheduled for the milling operation after final assembly to achieve perfect keyway alignment on the shafts.



LONG-TIME TESTS: Creep-rupture testers check the pedigrees of new high-strength structural fasteners.

Threaded Fastener Locks Joints

Nut-Bolt Combination Withstands 200,000 psi at 900°F

To insure safe flight, supersonic aircraft are often disassembled for inspection.

This calls for dependable and reusable fasteners — with good strength at high temperatures.

▪ Supersonic aircraft require dependable fasteners. These fasteners must withstand high stresses at elevated temperatures.

For rapid repairs or safety checks —which sometimes call for complete aircraft disassembly—the fasteners have to provide reusable and reliable service. They must retain their high-temperature strength and positive locking action through repeated usage.

Naturally, by increasing bolt sizes it's easy to add to their holding power. But this is not the proper answer to the problem. Adding to the fastener's mass hinders optimum flight performance.

Dependable Joints—A new nut and bolt combination, developed by the Standard Pressed Steel Co., Jenkintown, Pa., produces dependable threaded joints for service at high heats. Each of these threaded joints withstands up to 200,000 psi at 900°F.

Ratings for the new 926 series fastener include a tensile strength of 260,000 psi at room temperature. Thus, hot or cold, the newcomer insures strong structural bolting.

Most mechanical properties—tensile, shear and fatigue strengths —run 15 to 25 pct higher than those of the strongest previous 900°F bolt-nut joints. This means the new "super bolts" can effect aircraft and missile weight reductions.

Use Smaller Bolts — EWB 926 bolts, two or three diameter sizes smaller than conventional high-strength fasteners, can be used without loss of holding power. A ½-in. EWB 926 joint does the job of a ⅝-in. MS 20010 bolt-and-nut combination. The new joint thus saves

Fastener Has Good Properties

	Room Temp., psi	900°F, psi
Tensile Strength	260,000	200,000
Yield Strength	215,000	150,000
Shear Strength	156,000	120,000
Fatigue Strength, 65,000-cycles average	135,000	115,000
Endurance Limit, at 8,000,000 cycles	110,000	90,000
Stress-Rupture Strength, at 100 hours		140,000

40 pct in fastener weight.

Other weight savings can result from a redesign to smaller flange sizes. Use of a reduced bolt-diameter size makes smaller flanges possible.

Fatigue strength of the 926 series bolt is worth noting. It represents an increase in direct proportion to the higher tensile strength of the fastener. Tension-tension fatigue strength at 65,000 cycles is 135,000 psi. Endurance limit is 110,000 psi at 8,000,000 load cycles.

In summary, the 926 series fastener produces stronger joints at 900°F than most high-strength bolts exhibit at room temperature.

Good Design—Actually two new products in one—an EWB bolt with mating FN 926 self-locking nut—the combination meets strength and weight-saving needs in aircraft, missiles and other high-temperature equipment.

Complementary design of mating bolt and featherweight nut results in a high strength-to-weight ratio. This design also insures retention of mechanical properties at high heats.

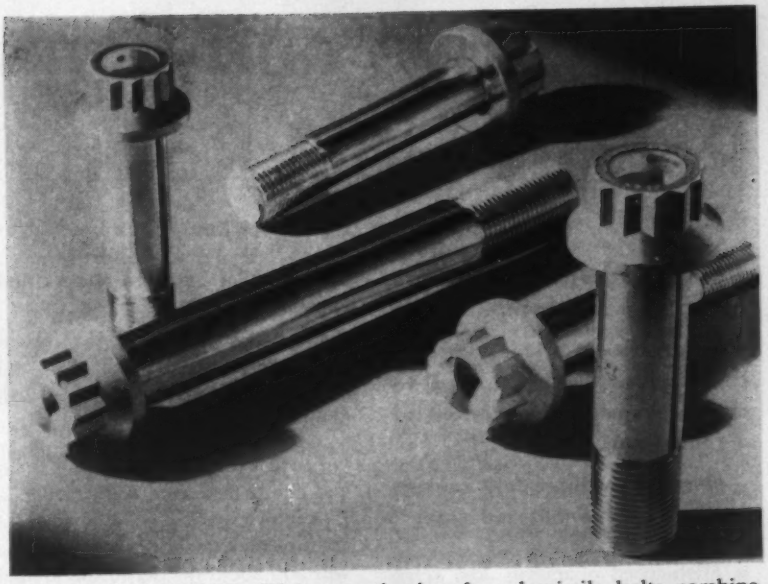
The EWB 926 is a 12-point external wrenching bolt. It's made of a 5-pct chrome, high-strength steel alloy. Diffused nickel-cadmium plating provides the finish. This finish resists corrosion and oxidation at temperature extremes.

Threads, rolled after heat treatment, have roots with large radii. And these radii reduce stress concentrations. Result: Higher fatigue and stress-rupture performance.

Complementary Nut — The FN 926 self-locking nut is an addition to the SPS featherweight line. Designed to develop the full strength of the bolt with a minimum of nut weight, the new nut incorporates close tolerances on the nut-bearing surface.

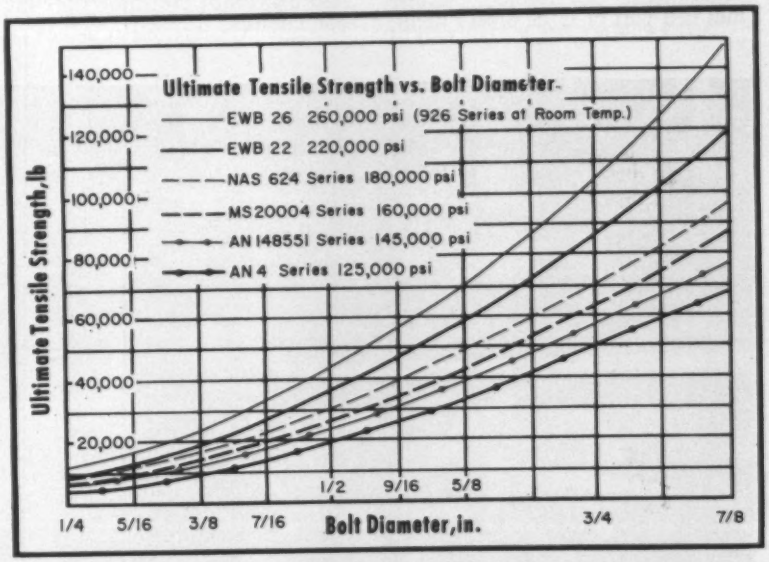
Squareness of the nut-bearing surface to thread-pitch diameter is held to 15′ through the complete range of diameter sizes.

Positive locking action prevents loosening from vibration. This locking action is achieved by a three-point displacement of the locking collar. Tests show a high retention of positive locking action after repeated usage.



USE HOT OR COLD: High-strength aircraft and missile bolts combine good strength with light mass. Each bolt is rated at 200,000 psi at 900°F. Room temperature rating is 260,000 psi minimum tensile strength.

New Design Strengthens Bolt



Nut Stays Tight—After 15 separate application cycles—seating to 160,000-psi load and soaking at 900°F—the FN 926 retains locking action that meets MIL-N-25027 requirements.

Nut material is aircraft-quality alloy steel AMS 6304. Each nut is forged and finished with diffused nickel-cadmium plating.

The 926 series bolts and nuts are produced in diameter sizes from No. 10 to ⅞-in. diam. All sizes incorporate fine threads. Quality control is maintained by 100 pct magnetic-particle inspection.

New Drive and Control System Powers Steel Rolling Mill

Steel processing lines are taking on a new look.

Programmed drive and control systems are now used to boss the complex operations of a rolling mill.

Here's how three-fold savings are felt by the mill and user.

■ High-speed operation, low scrap loss, and uniform product quality are among the operating advantages of U. S. Steel's new South Works structural mill.

A highly automated rolling facility, the five-stand structural mill is a part of U. S. Steel's multi-million-dollar modernization and expansion program.

General Electric and U. S. Steel engineers integrate mechanical and electrical equipment into a unified, highly automatic mill.

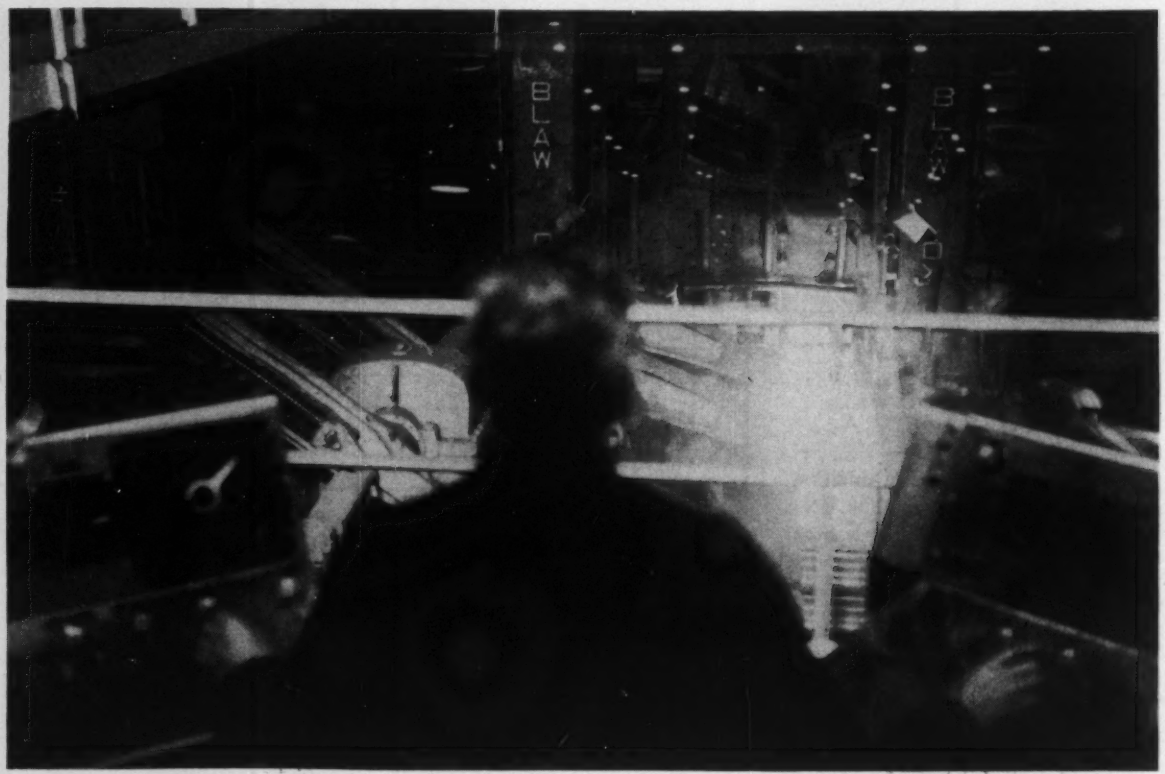
First Year Results—Both men and equipment were subjected to a shakedown period of one year. It confirmed that the new controls will add about 40 pct to the annual capacity to produce wide-flange beams of all weights.

Key to its high capacity is the operating speed—about 1,500 fpm. Another factor is the precise, automatic setting of reduced scrap losses and cobbles.

This is the prime reason for designing the high degree of automation into the mill. According to U. S. Steel, no operator could make the consistently accurate settings that are required by the mill.

Controls the Key—The specially engineered control system uses punched-card data to automatically direct all operations. The operations included, a breakdown mill, two reversing finishing stands, and two non-reversing finishing stands.

General Electric designed an entirely new program control system for the mill. Static switching components direct the reading of punched-cards and convert it from



ELECTRONIC CONTROL SYSTEM — Operator relies on the complex controls to boss the operations of a reversing hot mill. The giant structural mill is capable of turning out 250 ft lengths automatically.

binary decimal to decimal code.

A total of 43 operations are automatically controlled and sequenced by preselected data stored on punched cards. They are fed into the control system by the static logic elements.

Efficient Speed—As many as 21 passes through the five stands can be automatically programmed by the punched-card system. It directs the breakdown and forming of steel blooms ranging up to 5 tons.

Operating at full speed, the mill can turn out 250-ft structural pieces at the rate of one every 19 seconds.

Another unique feature of the mill is its capability for double-rolling on the two reversing stands. Other advances include automatic bloom manipulation, individual manual "takeover" for each of the programmed functions, and programmed speed unbalance.

What's Speed Unbalance — Development work and system analysis by U. S. Steel and General Electric's engineers made possible the unique drive system that includes a speed-unbalance feature.

Speed unbalance, or speed-ratio control, is provided at the breakdown mill and on the main drive at stand one. The control system maintains the desired speed relationship between independent drives on top and bottom rolls.

It has sufficient precision to eliminate the need for expensive, space-consuming pinion stands. The ability to automatically adjust speed ratio to compensate for turnup or turndown of workpiece ends gives the roll designer new latitudes in design. It also reduces costly re-grinding of many structural-shape rolls.

Mechanical Hands — Card programming of side guides and fingers at the breakdown mill has resulted in automatic handling and alignment of incoming blooms. Both 90 and 180° turns are performed during rolling at this stand.

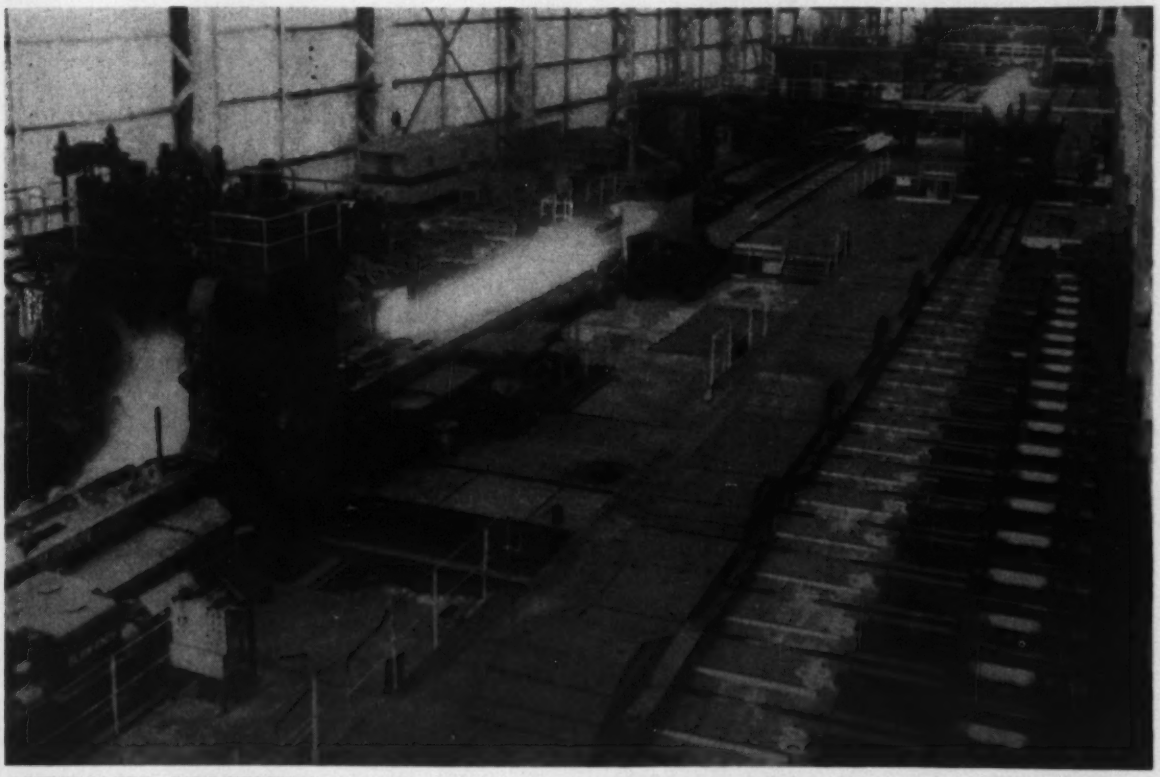
In operation, the control system guides blooms into the breakdown stand, through the two reversing finishing stands, and through the two non-reversing finishing stands.

Structural pieces are then cut and transferred semi-automatically to cooling beds. From that point, the structural shapes — wide-flange beams, I-beams, zee-bars and other structural products — are directed through a series of transfer table operations.

They then pass through a straightener, and onto an inspection bed. Here individual pieces are automatically turned over by a notched wheel for visual inspection.

Section and Ship—After gaining final approval the shapes are cut to required lengths and transferred to a piler area from which they are removed by an inter-works train according to customer order.

Transfer of pieces to trains is handled by cranes. The hoist and trolley motions of synchronized cranes handle the various sizes.



AUTOMATIC PROCESSING—Various shapes are rolled at the rate of one every 19 seconds. To achieve this the drive and control system speeds 5 ton blooms and slabs through the mill at rates of about 20 mph.

New Lathe Tackles Tough Jobs

To maintain the top spot in world production; it is essential that men in metalworking stay abreast of new tools.

New machines are constantly hitting the market. They should be evaluated.

■ A 75-hp heavy-duty engine lathe, developed for steel mill, foundry and general machine shop work has been built by the Sidney Machine Tool Co., Sidney, Ohio.

The lathe is completely new in design from the floor up. The headstock provides thirty-six spindle speeds and 75 hp in all speed ranges. It features a 160 to 1 speed ratio in true geometric progression and the cutting speed is automatically calculated.

This enables the machine to remove up to 180 cu in. of metal per minute. These features mean greater speed, accuracy, ease of operation and therefore reduced operating costs.

Rigid Construction — The lathe is capable of handling up to 504 in. lengths with a 40½ in. diam swing over the bed and a 25½ in. swing over the compound. The unit provides special rigidity because of its full width compound and the three dimensional truss design of the bed.

The latter feature enables the lathe to handle torsional loads at the full 75 hp. The bed is full depth the entire length and has replaceable hardened and ground tool steel ways.

The lathe is actually a product of extensive coordination with lathe users throughout the country. It was developed to meet with their particular needs.

Improves Finish—With the opposed helix angle, or final herring bone drive gears, the lathe can achieve a 22 to 26 microinch finish. This capability for smooth cutting means that subsequent operations can be eliminated on certain jobs.

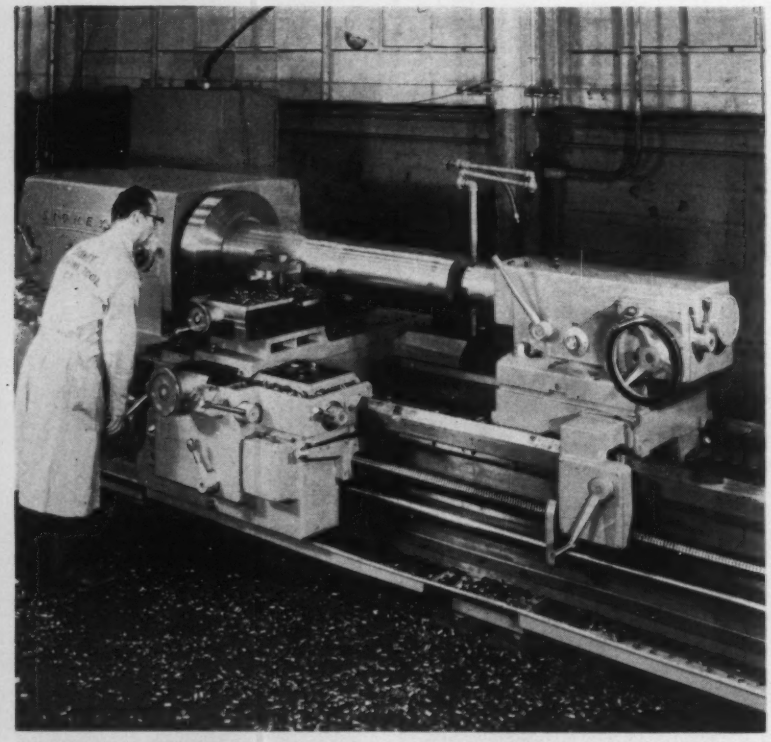
In addition, smoothness of operation and greatly reduced maintenance are assured with hardened and ground or shaved gears in the headstock. It also features all SAE involute splines and automatic metered spray lubrication.

The machine's end gearing is totally enclosed in a cast housing and automatically lubricated. A notable advantage in the end gearing is the provision for converting from conventional to metric leads. Here the much simplified 1 to 1 end gear ratio makes possible the quick and accurate conversion for greater flexibility in production.

More Treads And Feeds—The gearbox also is completely antifriction and has automatic filtered lubrication. It provides 60 threads and feeds, which give more versatility. The gearbox direct-reading feed and thread plate provides ready visual access to setting data together with dial and lever controls.

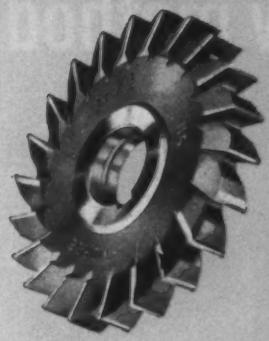
The carriage features variable rate, four-way power rapid traverse. This combines maximum control with simple operation. At the same time, in feed, the carriage is fully protected against jamming through such safety devices as the electric clutch and pressure release mechanisms. They are designed to prevent apron damage should the operator accidentally run the carriage into an obstruction.

The apron of the lathe provides combination feed and traverse control plus independent cross and longitudinal controls. Feeds may be separate or synchronized, giving full versatility to this operation.



NEW LATHE DESIGN—The heavy duty engine lathe turns SAE 6145, RC 24-26 with a surface speed of 288 fpm at 0.0835 and 1 in. depth cut. High horsepower and many spindle speeds add to its versatility.

MORSE DISTRIBUTORS GIVE YOU "ALL THE MOSTS"



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Dramatic new method of alloying called. . .

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Lee Wilson Open Coil Process of Gas Alloying advances an entirely new concept in steel chemistry!

Now for the first time it is economically feasible to gas alloy steel in coil form at the annealing station. Lee Wilson engineers have successfully added or removed nitrogen and carbon by introducing gaseous elements during the annealing period. This opens up a whole new concept of steel alloying which will increase rolling mill efficiency, improve alloy uniformity, and save steel makers millions of dollars annually.

How It Works—Long a theory, gas alloying became possible when Lee Wilson engineers developed the first successful method for opening and handling opened coils at production rates. By threading a nylon cord or metal tape between each lamination of the coil, the coil is "opened" with an air space between each wrap. Thus the entire surface of the coil is open to special atmospheres which can be introduced during the annealing cycle, and any gas equilibrium reaction that exists within the area of the steel is at the correct temperature level for the constituents of the atmosphere gas and the interstituals in the steel. It is this compatibility of heat, atmosphere and steel composition that makes gas alloying possible.

Field Tests Show Vast Potential—Already actual field tests have shown that the Lee Wilson Process of Gas Alloying can produce a non-aging rimmed steel by reducing carbon and nitrogen. It also creates a vastly improved enamel iron product. By controlling the carbon content and grain structure in rimmed steel, a superior material for extra deep draw galvanized stock is produced. The removal of carbon and nitrogen in rimmed steels produces a strip of exceptional uniformity that can be substituted for low grade silicon sheet for motor laminations, and by reducing the carbon content in silicon sheet the electrical characteristics and surface conditions are substantially improved. By reversing the process, carbon and nitrogen can be restored to the steel in any desired quantities. By using the Open Coil Process, the Bessemer process can now produce sheet steels of equal quality to the open hearth process. This could save as much as 20% in the cost of many grades of sheet steel. At the coiling station such jobs as cleaning and inspection can be performed easily and automatically. Imaginative engineers and metallurgists immediately see many other advantages—many of which are undergoing tests in one or more of the pilot units now in the field. The potential of this new system now appears almost limitless.

How To Learn More About It—There is little wonder that an executive of one of the nation's leading steel makers called it "the greatest advance in steel making in the past decade" If you are not up to date on the Lee Wilson Open Coil Process of Gas Alloying why not let us arrange to have a Lee Wilson engineer meet with you at your convenience. We will have full particulars at our Booths 78,79 at the AISE Annual Convention and Iron and Steel Exposition in September. A full description, together with an animated motion picture, has been scheduled as a part of the program. Check your show schedules and plan now to attend.

Patents applied for.

* ORIGINATORS AND LEADING PRODUCERS OF OPEN COIL AND SINGLE STACK FURNACES

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PATENT REVIEW

New Patents In Metalworking

Galvanizing Process

Method of hot-dip galvanizing a ferrous metal, A. T. Baldwin (assigned to Hanson-Van Winkle-Munning Corp., a corp. of N. J.), June 14, 1960. In the galvanizing of ferrous metal articles, the article is wetted with an aqueous solution of zinc chloride. It is then dried and dipped into molten zinc through a floating salt—comprising zinc chloride and potassium chloride—and withdrawn. No. 2,940,870.

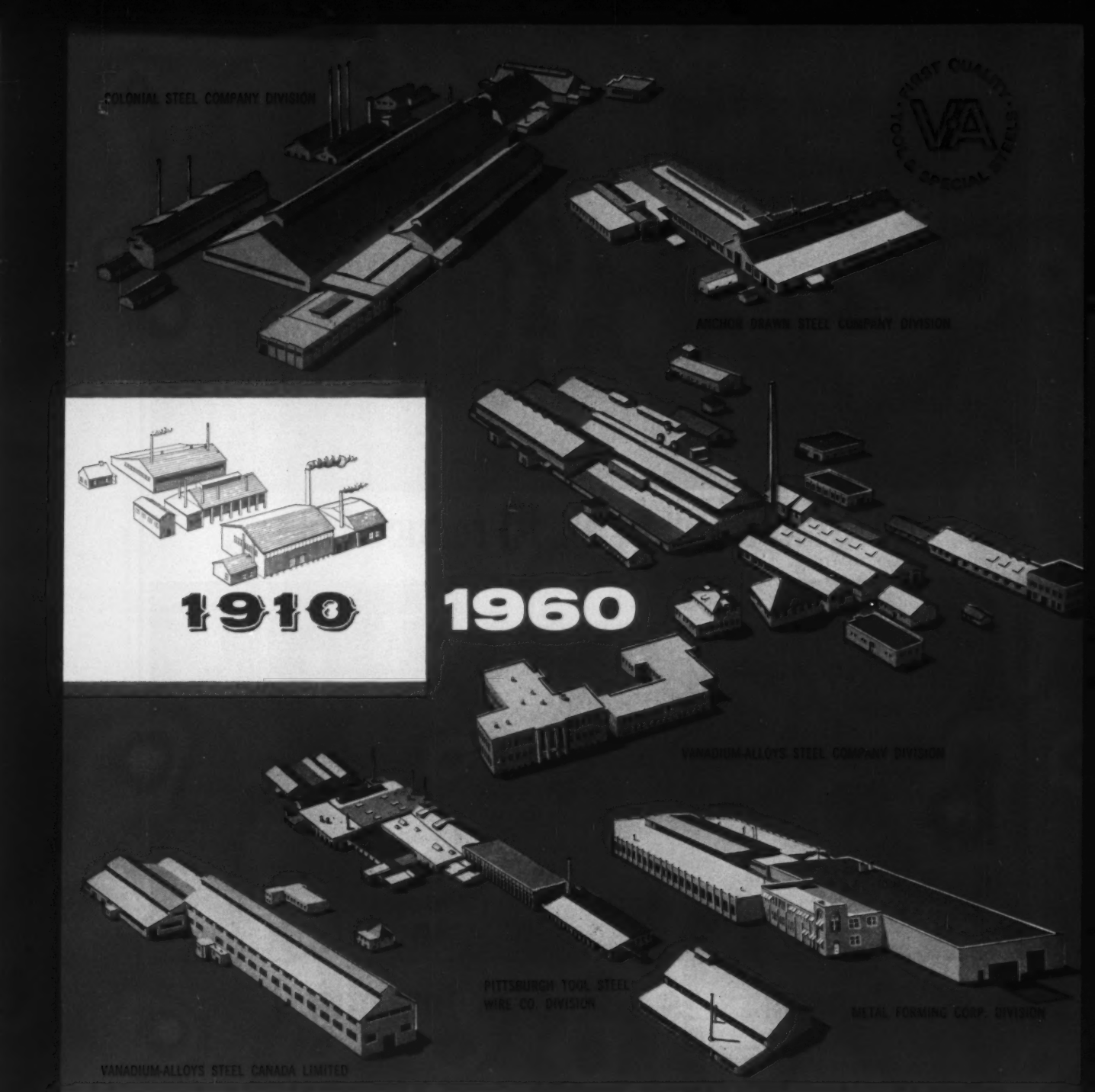
Eliminates Scratches

Process for the cold reduction of strip metal, G. E. Barker and C. E. Santangelo (assigned to Quaker Chemical Products Corp., Conshohocken, Pa.), May 31, 1960. In a method for eliminating friction scratches in pickled steel strip, the metal is coated with a stable lubricant of certain specified characteristics. This coating is done prior to being passed between the reducing rolls. Higher rolling speeds may be used than those employed when palm oil is the lubricant. No. 2,938,262.

"Patent Review" now appears in The IRON AGE as a regular weekly feature.

Improves Cladding

Clad metal body and method of making the same, P. Brenner (assigned to Vereinigte Leichmetall-Werke G.m.b.H., Bonn, Germany), May 24, 1960. In the cladding of steel sheets or the like, with aluminum and aluminum-alloy facing sheets, an aluminum-silicon alloy sheet is placed in the middle of the iron and aluminum sheets. Consequently, formation of iron aluminides during hot rolling and soft annealing is prevented. No. 2,937,435.



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and special steels

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Mid-States Diversifies Product Line...

Consolidates Lubricant Inventory!

The past twenty years have seen Mid-States Steel & Wire Company greatly diversify their product line while they simplified their lubricants inventory. Today you would find at Mid-States, banks of nail-making machines pouring out over 35 tons of nails every day . . . new fence-making machines . . . machines producing hardware cloth, ornamental wire, baler wire, wire lath, welded fabric, window guards. The list could go on and on.

While the number of products has grown, Mid-States, with the cooperation of Cities Service Lubrication Engineer "Ken" Mosher, have constantly studied their lubrication requirements and have reduced the number of individual lubricants. Pacemaker oil serves as a hydraulic oil and also as a lubricant on many machines. Cities Service multi-purpose Trojan H grease does triple duty throughout the plant. Cutting oils and other lubricants are held to a minimum by selecting a quality lubricant to serve several applications. Reducing the number of lubricants saves valuable warehouse space and cuts the chance of error in servicing machines.

Call your local Cities Service office for a Lubrication Engineer to show you how you can reduce your lubricant inventory. Or for full information write: Cities Service Oil Company, Sixty Wall Tower, N.Y. 5, N.Y.

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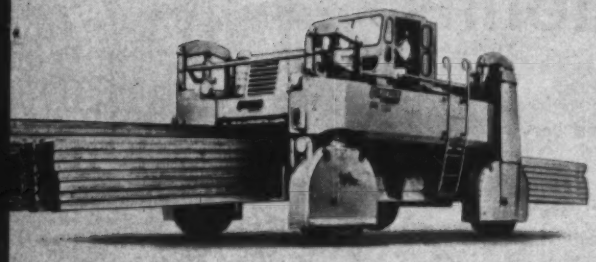


1 YOU LEASE *without down payment!*

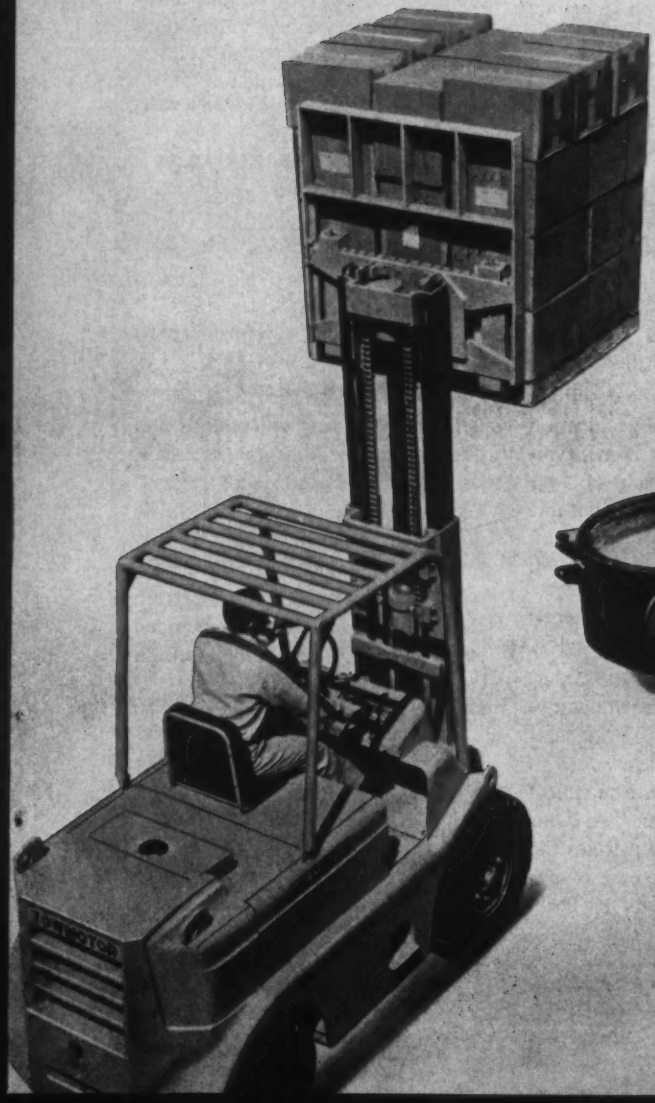
You don't make a *down payment* when you use the Towmotor-Gerlinger Lease-A-Truck Plan. You put T-G equipment to work on a continuous, year-'round basis. You just make a small monthly payment—paid out of savings the equipment produces.

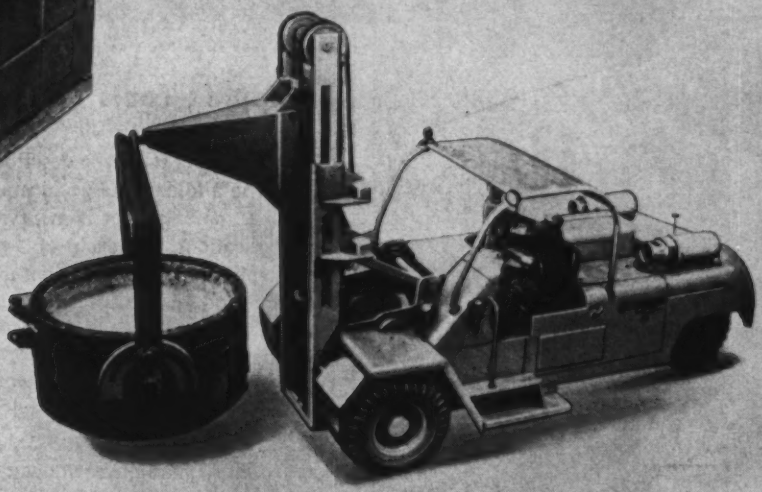
2 YOU RENT *without cash outlay!*

You don't tie up working capital when you *rent* Towmotor-Gerlinger fork lift trucks and material carriers. You put them to work immediately. You start cutting handling costs immediately. Your only cash outlay is one small monthly charge.

3 YOU BUY *and save as you pay!*

You don't pay cash for Towmotor-Gerlinger equipment when you use our low-cost Time Payment Plan. You make reasonable monthly payments. Low interest rates make it easy. Handling economies consistently pay the monthly cost many times over.





Complete factory-supervised maintenance can be included in *any* of the above plans! For complete information, write Towmotor-Gerlinger Rental Division, Towmotor Corporation, Cleveland 10, Ohio.

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New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 157.

Finishing Machine

A four-page, illustrated bulletin describes a combination finishing machine. The machine was designed for use where custom or production finishing operations must be performed efficiently and economically. Numerous action photographs and text describe in detail the specific operations that this machine can perform. (Walker-Turner Div., Rockwell Mfg. Co.)

For free copy circle No. 1 on postcard, p. 157

Strapping Tools

Twelve models of power combination strapping tools are described in detail in a folder. A specification chart lists, among other items, typical applications for each of four electric-powered tools and eight air-powered models, and the maximum strap tension and weight for each. (Signode Steel Strapping Co.)

For free copy circle No. 2 on postcard, p. 157

Pipe Insulation

The thermal and physical characteristics of a one-piece pipe insulation, for service from below zero to 350°F, are described in a technical bulletin. The four-page, two-color bulletin describes and illustrates the mineral fiber material's ease of application and handleability. Thermal conductivities of the lightweight, resilient insulation are shown graphically. (Baldwin-Ehret-Hill, Inc.)

For free copy circle No. 3 on postcard, p. 157

Combustion Control

Combustion-control equipment is the subject of a 16-page catalog. The catalog is profusely illustrated with diagrams and photographs of installations. A series of three double-page cut-away schematic drawings illustrate various applications of the combustion-control equipment. (Morgan Construction Co.)

For free copy circle No. 4 on postcard, p. 157

Thermocouple Fittings

Fully illustrated, a 32-page catalog describes a compete line of thermocopule fittings, pressure sealing glands and thermocouple accessories. (Conax Corp.)

For free copy circle No. 5 on postcard, p. 157

Foundry Supplies

Foundry parting compounds and liquids, release agents, silicones, shell molding and core release agents are described in a fully-illustrated, 12-page catalog. Preparation and application information, and an article covering pattern cleaning methods are also included in the catalog. (The Hill & Griffith Co.)

For free copy circle No. 6 on postcard, p. 157

Brazing Techniques

A 24-page illustrated manual describes brazing techniques on all commercial brazeable metals and alloys. The comprehensive manual details basic brazing functions. (All-State Welding Alloys Co., Inc.)

For free copy circle No. 7 on postcard, p. 157

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A 5000° flame takes ten minutes to penetrate a one-quarter inch piece of CDF's new Dilecto RD-105 laminate. The same thickness of cold-rolled steel is pierced in less than forty seconds.

Molded from graphite fabric impregnated with a heat (ablation)-resistant phenolic resin, new CDF grades RD-105 and RD-115 are being evaluated in solid propellant rocket motors.

Dilecto laminates are only one family of products from industry's largest selection of non-metallic structural materials and electrical insulations. Vulcanized fibre, silicone rubber and mica, and thermosetting moldings are also supplied by CDF.

CDF can provide both quality and true economy in selecting plastic materials best suited to your needs. Refer to SWEETS PD file or write to us for General Folder 60.

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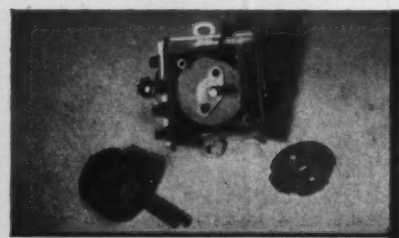
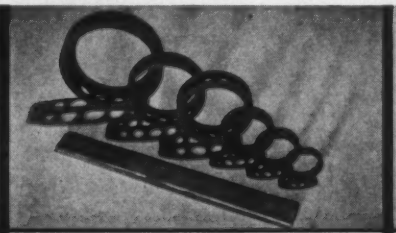


Moisture-resistant and low cost Dilecto cams for automatic washer and dryer controls.



Dimensionally stable, light weight, oil-resistant Dilecto ball bearing retainer rings.

Easily fabricated paper-base, punching grade Dilecto precision switch insulators.

General Electric, as developer and user of many heat processes, has the know-how to reduce your costs and improve your product quality.

HEAT
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How General Electric heat process know-how can cut your costs, improve product quality

There's only one correct starting point in manufacturing an industrial furnace—process know-how. By building on our knowledge of your particular heat processing problems, General Electric is able to develop the most economical heating method for quality results on your line.

Example: A commercial heat treater now saves nearly 50 percent of his raw material costs while maintaining quality specifications. General Electric understood the product requirements, and developed a heat treatment which permitted substitution of common iron for silicon steel.

Example: Shorter production cycle and reduced cost resulted when pickling was eliminated in one manufacturer's process. Bright annealing of stainless steel parts in a General Electric mesh-belt, semi-continuous muffle-less furnace produced bright, shiny parts of high quality.

Ask your nearby General Electric Apparatus Sales Office to analyze your heating process requirements. A G-E heating specialist will provide you with the "added value" service that can improve your product and save you money for years to come.

721-31

GENERAL ELECTRIC

Flash butt-welding titanium extruded section eliminates 38 lbs. of material...plus machining

When an extruded shape closely approximates the finished cross-section of a circular part, you can save money—particularly where expensive materials are involved. This titanium ring was circular formed and flash butt-welded from the section shown above. Material savings were $262.00 per ring, plus $46.00 on machining.

Amweld is equipped to supply flash butt-welded rings and circular products in stainless, titanium, aluminum, as well as a wide variety of corrosion-resistant alloys. If you would like to know more about Amweld's welding, fabricating and complete machining facilities, phone or write.

GET THE FACTS ABOUT AMWELD

New 20-page catalog describes flash butt-welded rings and circular products manufactured by Amweld. Also booklet entitled, "How Flash Butt-Welded Rings are Made."

AMWELD® INDUSTRIAL PRODUCTS

THE AMERICAN WELDING & MFG. CO. • 120 DIETZ ROAD • WARREN, OHIO

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Disk Grinding Wheels

Many types of disk grinding wheels are illustrated in a color brochure. Photographs of the various types of disk wheels are included. In addition, recommendations for the disk grinding of various products and types of materials are also given. (The Macklin Co.)

For free copy circle No. 8 on postcard

Small AC Motors

Small ac special-application motors, offering 16-hp ratings between 1/100 and 1/3 hp, are described in a bulletin. These motors have been designed for quiet running in small areas. The eight-page bulletin lists construction features, ratings, and dimensions of 32 specific models in the line. (Robbins & Myers, Inc.)

For free copy circle No. 9 on postcard

Handles Metal Chips

Metal-chip handling systems, for automatic, continuous crushing and de-oiling of metal chips and turnings, are described in a 12-page booklet. Included in the booklet are photographs and diagrams of custom-engineered systems for both large and small plant operations that require mass matching of ferrous or nonferrous parts. (Link-Belt Co.)

For free copy circle No. 10 on postcard

Gas Producers

Gas producers are described in a four-page bulletin. These units provide a low-cost "neutral" atmosphere to prevent oxidation and decarburization during annealing, normalizing, hardening, brazing and sintering. The publication also gives operating data, ratings, dimensions, sketches and cutaway drawings of these gas producers. (General Electric Co.)

For free copy circle No. 11 on postcard

Tube vs. Bars

Consisting of four-pages, a technical bulletin contains weight-comparison tables for welded steel tubing and solid bars. This bulletin also contains highly useful tables of drive-shaft torque values, physical properties and available sizes of welded steel tubing. (The Standard Tube Co.)

For free copy circle No. 12 on postcard

Zirconium Data

Technical information and data on zirconium is compiled in a data file. Illustrated with numerous charts, pictures, tables and graphs, it is an authoritative handbook on zirconium. (Zirconium Information Center)

For free copy circle No. 13 on postcard

Pressure Processing

A 16-page bulletin describes an entire line of press equipment for pressure processing. Also illustrated and discussed are plastic-molding machines; including conventional and preplasticizing injection machines, as well as compression, transfer, reinforced plastic presses. (The Hydraulic Press Mfg. Co.)

For free copy circle No. 14 on postcard

Spray Welder

Describing a spray welder, a bulletin also lists its advantages. The bulletin also contains a step-by-step outline discussion of the spray weld process. (Wall Colmonoy Corp.)

For free copy circle No. 15 on postcard

Gas Carburizing

A discussion of the newest developments and present status of high-temperature gas carburizing is presented in an eight-page booklet. Numerous heating curves, test sample photomicrographs and photos of typical high-temperature carburizing equipment illustrate this dissertation. Another article gives an ac-

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FREE LITERATURE

count of a modern concealed quench furnace used for commercial heat treating. (Midland-Ross Corp.)

For free copy circle No. 16 on postcard

Thermocouples

The metal-sheathed, ceramic insulated construction of thermocouples is explained, and typical applications are cited in a bulletin. A feature of the bulletin is a table giving complete specifications of various thermocouples available. (The Bristol Co.)

For free copy circle No. 17 on postcard

Stainless Pipe, Tubing

A four-page brochure illustrates the manufacturing and testing of stainless, full-finish rock-forged pipe and tubing and stainless full-finish pipe and tubing. Price and size availability is included. (Swepco Tube Corp.)

For free copy circle No. 18 on postcard

Automatic Welding

A six-page folder illustrates and describes a complete line of automatic and semi-automatic arcwelding equipment. Applications for different automatic welding processes are also illustrated. (Hobart Bros. Co.)

For free copy circle No. 19 on postcard

Relief Valve

A series of data sheets detail a low-pressure, hydraulic cartridge relief valve and its applications. The data sheets feature pressure curves, dimensions and complete specifications for this direct-acting relief valve. (Fluid Regulators Corp.)

For free copy circle No. 20 on postcard

Motor Products

Listing in brief, easy-to-use arrangement, an eight-page brochure serves as a quick reference to complete motor and generator lines. AC motors range from 1/40-300 hp. They include a complete line of standard motors in a broad range of voltages, speeds, mountings and enclosures, and designs for a wide variety of special applications. (Howell Electric Motors Co.)

For free copy circle No. 21 on postcard

Cutters

A 64-page book gives information on an expanded line of end mills and milling cutters. The new line of milling cutters embraces a wide range of the most popular types. The illustrated book gives complete data on both lines of cutters. (The Cleveland Twist Drill Co.)

For free copy circle No. 22 on postcard

Thrust Bearings

Cylindrical roller precision thrust bearings is the subject matter of a catalog. It features detailed engineering data on the company's thrust bearings and a new line of thrust bearings with metric dimensions. (Rollway Bearing Co.)

For free copy circle No. 23 on postcard

Trucks for the Foundry

Specifically prepared for the foundry industry, an eight-page brochure photographically and editorially tells the story of how electric trucks are used in this particular industry. (Elwell-Parker Electric Co.)

For free copy circle No. 24 on postcard

Soak Cleaners

A technical bulletin describes and discusses eight soak cleaners. They represent general fields of use and indicate the range of the line. Included are applications and features of the specific cleaners, recommended cleaning time and temperature at which each is used. (Frederick Gumm Chemical Co., Inc.)

For free copy circle No. 25 on postcard

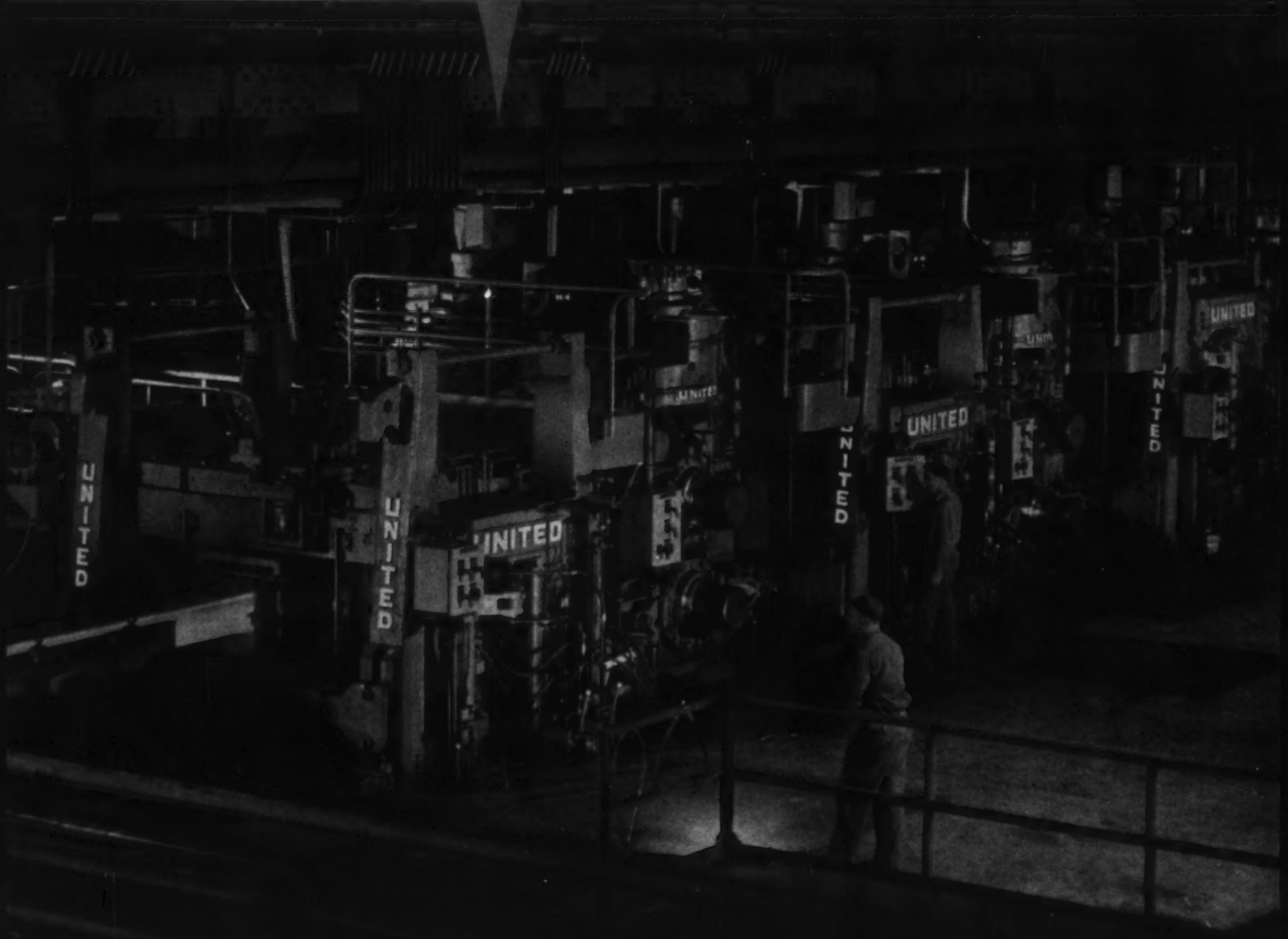
Pipe-Line Strainers

With detailed information and specifications, a two-page data sheet concerns itself with a complete line of pipe-line strainers. The filters are designed to remove such contaminants as pipe scale, core sand, metal chips or construction dirt that may exist after initial installation of equipment. (Air-Maze Corp.)

For free copy circle No. 26 on postcard

UNITED®

6–Stand continuous horizontal and vertical Billet Mill



UNITED ENGINEERING AND FOUNDRY COMPANY
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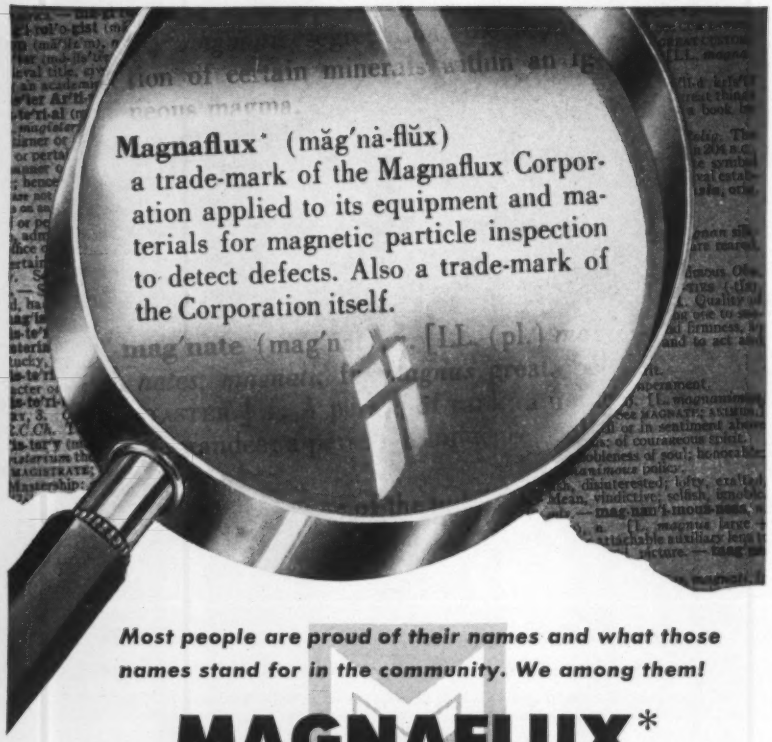
Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.


Magnaflux* (măg'nà-flŭx)
a trade-mark of the Magnaflux Corporation applied to its equipment and materials for magnetic particle inspection to detect defects. Also a trade-mark of the Corporation itself.

Most people are proud of their names and what those names stand for in the community. We among them!

MAGNAFLUX*

is a Trade Mark

Magnaflux Corporation pioneered non-destructive testing with inspection methods to detect defects that give industry low cost means to insure dependable quality. Result: better products at lower cost turned out with less waste, for more people.

Magnaglo* and Zyglo* and certain other names are also trade-marks registered by us. They have become recognized symbols, for inspection equipment developed and sold by Magnaflux Corporation—used by more industries, for more inspection operations than all other methods combined!

But "Magnaflux"* stands for even more than this. For users of Magnaflux*, it stands for unlimited co-operation, counsel and research in non-destructive testing methods. It stands for the personal help of trained non-destructive testing engineers—for instruction schools and providing new information. All this is part of our service.

If you'd like to know more about Magnaflux Corporation —its people and its methods—write for the booklet "Seeing Isn't Always Believing." Hundreds of businessmen and executives have found it interesting reading.

Magnaflux Corporation, A Subsidiary of General Mills, 7302 W. Lawrence Avenue, Chicago 31, Illinois.

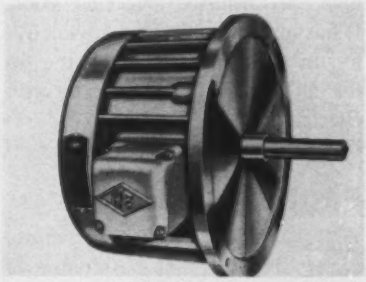
MAGNAFLUX CORPORATION

General Mills **TEST SYSTEMS**

*Registered U. S. Patent Office

New Materials and Components

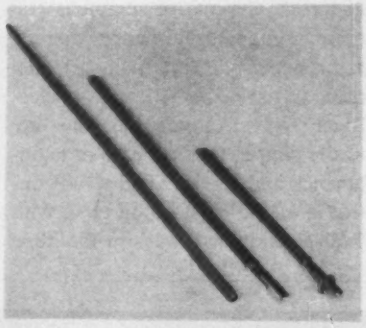
Machine-Tool Motors Offer High Horsepower



Built exclusively for machine tool use, a series of machine-tool motors features a newly designed frame. The units come in two new ratings, 15 hp and 20 hp; also ½-10 hp. Other features of the motors include: unusual vibrationless running characteristics; special radial air gap design with a light, thin, low-inertia rotor, provides smooth-start-quick-stop operation. Fin-type, cast-aluminum frames dissipate heat about three times as efficiently as cast iron. (Reuland Electric Co.)

For more data circle No. 27 on postcard, p. 157

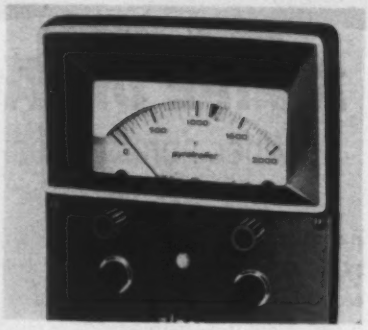
Couplings Take-Up Movements in Flexible Members



High-temperature flexible shaft couplings have squared ends. The square facilitates the engagement for the drive and also allows for slight changes in length due to varying torques. The formed square on the end is held to close tolerance and is lower in cost than fittings. The length varies to suit the particular application. The couplings are made of 5/16-in. diam flexible shaft core which is made of high-carbon wire; it is capable of operating in temperatures upward to 300°F. The flexible couplings are ideal for certain controls that must operate at temperatures too high for hydraulic controls. (Stow Mfg. Co.)

For more data circle No. 28 on postcard, p. 157

Controller and Indicator Form Single Unit



Suitable for original equipment and field application, a temperature-indicating controller requires little space. The space required by the unit is 6⅜ x 7 in. This makes it desirable as a panel-board instrument. The controller comes in eleven ranges from 0-400°F to 0-3000°F; as well as an environmental test-chamber range of —100 to +300°F. The electronic on-off controller and pyrometric temperature indicator has been designed for use on ovens, heat-treating furnaces, die - casting machines, injection molding machines, and a multitude of processes requiring precise continuous control. (Alnor Instrument Co.)

For more data circle No. 29 on postcard, p. 157

Metal Detector Detects Any Type of Metal

Completely transistorized, a proximity switch detects metal without any physical contact. The instrument's electrical components are sealed against moisture and dust hazards. Its operation is immediate. A neon lamp indicates pick-up signal. The detector is supplied with standard ½-in. male probe and 5 ft of shielded cable. Increasing or decreasing the cable length does not affect the efficiencies of the detector. The probe head is sealed to the cable and can be immersed in liquids. The unit has a capacity up to 1000 operations per minute. For high-speed applications, ballast replaces plug-in type relay providing electrical signals up to 100,000 operations per minute. (Automation Devices, Inc.)

For more data circle No. 30 on postcard, p. 157

DESIGN DIGEST

Soldering Tip

A long-life soldering tip cannot freeze or stick in the tip hole. It is made by a new anti-corrosion process. The tip meets the needs of ever-increasing use of high-temperature, high-performance soldering irons. It has maximum thermal conductivity. In all shapes and sizes, the tip fits all makes of irons. (Hexacon Electric Co.)

For more data circle No. 31 on postcard, p. 157

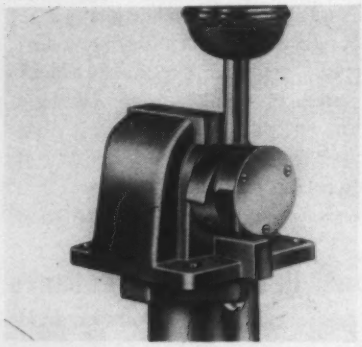
Position Control

A numerical positioning control offers point-to-point positioning of machine elements. Absolute decimal digital control employs no binary or analog circuitry, thereby resulting in an unusually simple, compact system. All major electrical and electronic elements are of the plug-in type for ease of maintenance and service. The servo control is of the closed-loop type, with final positioning always in the same direction, to eliminate the effect of back-lash in drive and control. (Carlton Controls Corp.)

For more data circle No. 32 on postcard, p. 157

Panel-Mounting Valve

Combining versatility and low cost with streamline appearance, a panel-mounting, directional valve serves well for use with consoles or



control panels. The single unit valve is normally closed or normally open for three-way operation. The double unit valve provides three types of four-way operation. Essentially all die-cast zinc for corrosion resistance, the valve contains hardened sintered steel cams. It is suitable for 250-psi maximum air pressure and temperatures from —40°—+200°F. (Westinghouse Air Brake Co.)

For more data circle No. 33 on postcard, p. 157

Grinding Wheel

Twenty-four in. in diam, a continuous, one-piece metal-alloy-bond diamond wheel offers many operating advantages over segmented wheels. Such advantages are: increased wheel life, better finishes and stock removal performance. In addition, the design reduces edge chipping, friction and wheel cost. (Action Diamond Tool Co.)

For more data circle No. 34 on postcard, p. 157

Toggle Switches

Compact toggle switches feature bright aluminum tabs that provide instant position indication. The switches come in both momentary and maintained-contact versions. Requiring about 1 in. of space behind control panels and weighing 1/14 oz, the new switches are

EXECUTIVE REPORT #12

A PIPE DREAM COMES TRUE

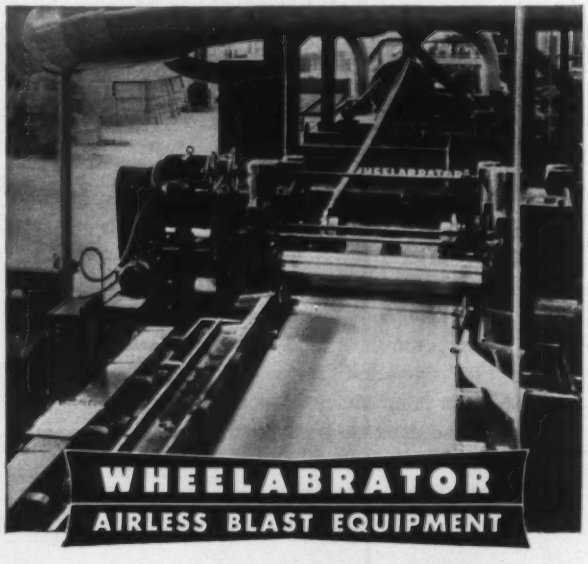
Wheelabrator® cleans skelp edges at new low cost

Another example of steel industry savings made possible by Wheelabrator mechanical descaling is the exceptional economy realized by pipe rolling mills in cleaning of skelp. Here it is desired to clean only a small strip along both edges of the bottom side of the skelp, which will be butted together and electro-welded.

In the Wheelabrator process, two blasting wheels are positioned to pinpoint their abrasive barrage along the edges, giving fast, thorough cleaning of these surfaces only.

Wheelabrator leads in mechanizing steel mill descaling methods

In over 100 installations in all types of steel mill applications, Wheelabrator has proven its cost-saving benefits. For engineering consultation call or write Wheelabrator Corporation, 510 S. Byrkit St., Mishawaka, Indiana. In Canada, P. O. Box 490, Scarborough, Ontario.

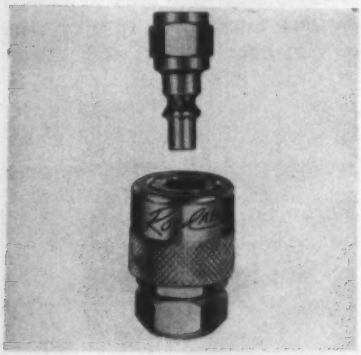


ideally suited to aircraft, electronic equipment, data-processing systems, industrial consoles and other areas where accurate long-life switches are needed. (Micro Switch)

For more data circle No. 35 on postcard, p. 157

Industrial Couplings

For use in shop air line and light pneumatic tools, a series of industrial couplings come in ¼- and ⅜-in. sizes. The quick-connect coup-



lings feature maximum flow and minimum pressure drop; self-sealing, 360° swivel action, retractable sleeves, and a high degree of interchangeability with similar couplings. They are light weight and extremely compact. (Airaterra)

For more data circle No. 36 on postcard, p. 157

Cut-Off Tools

Hollow-ground, straight blade cut-off tools, for automatic screw machines are made from T-5 high cobalt steel. T-5 steel provides unusual efficiency on long production runs. The line of blades has treatment which eliminates metal to metal contact. This minimizes galling and build up. (The Somma Tool Co.)

For more data circle No. 37 on postcard, p. 157

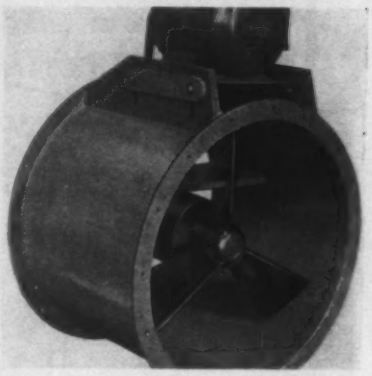
Deposits Coatings

Remotely-controlled, an electron-beam evaporating unit vaporizes all metals, ceramics, refractory compounds and other non-metallics. It is suitable for installation in almost any laboratory or commercial vacuum equipment operating at 3 x 10^{-4} mm of mercury or lower. It may be used for applications where thin metallic or non-metallic coatings are desired. The unit offers the advantage of high deposition rates. The packaged unit includes the remote-controlled electron beam gun, extra filaments, power-supply control panel and electrical feedthroughs. (The Alloyd Corp.)

For more data circle No. 38 on postcard, p. 157

Vinyl Fans

Solid-vinyl, belt-driven tubeaxial fans serve in highly-corrosive air-handling applications. The line of



fans comes in sizes from 16- to 36-in. diam and with air deliveries ranging up to 25,000 cfm. All parts

EXECUTIVE REPORT #24

APPEARANCES CAN BE DECEIVING

"Low-Price" Abrasives Can Be An Expensive Bargain

Measure the bars. The top one appears smaller, but it's not. Measure your present abrasive cost, and compare it with the proven low cost of Wheelabrator Steel Shot.

Don't be deceived by a low initial price. It's abrasive performance that gives true blasting economy . . . the lower abrasive consumption, faster cleaning, and lower maintenance enjoyed by users of Wheelabrator Steel Shot. Try it, and take a true measure of blast cleaning economy.

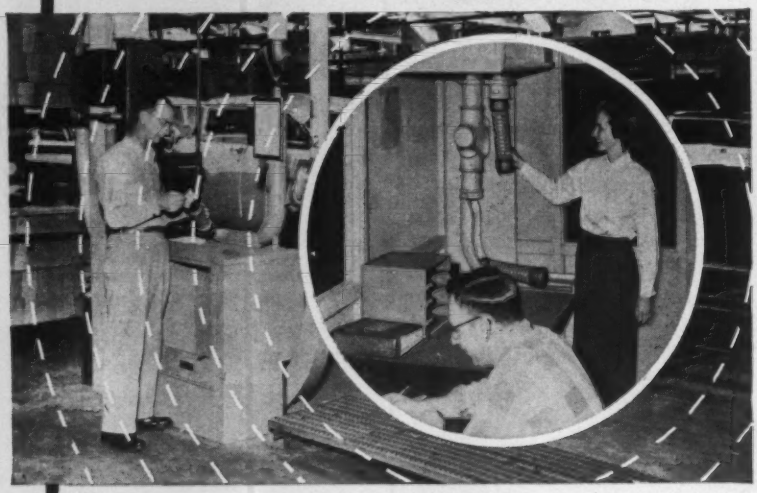
SEE THE PROOF IN YOUR OWN PLANT

Your Wheelabrator abrasive engineer will demonstrate the superior performance of Wheelabrator Steel Shot in your own plant. For data to help you control all your blast cleaning costs, write for Bulletin 905-D. Wheelabrator Corp., 510 S. Byrkit St., Mishawaka, Ind. In Canada, P.O. Box 490, Scarborough, Ont.

WHEELABRATOR
STEEL ABRASIVES

MECHANIZE... PROFIT-WISE!

...with a LAMSON AUTOMATIC AIRTUBE SYSTEM



Now, all departments are but seconds apart and fully informed

If time means money to you — why spend it on paper?
Stop for a moment. Try to estimate how much it costs to send one message from your department to another.

Multiply the costs

Now, envision a system whereby you place your message in a handy carrier, dial its destination, place it in a nearby LAMSON AUTOMATIC AIRTUBE and sit back confident that your message is flying through the air directly to its destination, arriving in a matter of seconds.

Multiply the service

Why not consult a LAMSON Field Engineer. He specializes in inner-communications systems that keep *orders, invoices, records, punch cards, blueprints, small tools, samples, inter-office memos, mail* . . . flying a controlled inner-air route at 25 feet per second, 24 hours a day — AUTOMATICALLY.

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They will amortize the entire cost of the installation. Simply clip this advertisement to your letterhead for full information about Automatic Airtube Systems and mail to:

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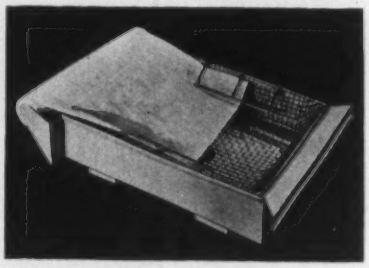
Manufacturers of Airtube® (Pneumatic Tube Systems) • Integrated Conveying Systems • Pallet Loaders • Selective Vertical Conveyors • Bookveyors® Clinical • Trayveyors® • Food Service Systems • Blowers and Exhausters • Exidust® Central Vacuum Cleaning Systems • Dryset® Air Vacuum Systems

of the fan, in contact with the air stream, are corrosion proof. The entire fan drum assembly is fabricated of solid vinyl and welded airtight. (Robbins & Myers, Inc.)

For more data circle No. 39 on postcard, p. 157

Coolant Filter

Gravity-fed, a coolant filter for machine tools has been developed for flow rates up to 16 gpm. The coolant filter employs rolls of inexpensive filter paper. It can be installed under the coolant outlet of most machine tools with no alterations or even piping required. When paper becomes loaded with sludge, a clean area is pulled out. Dirty paper with sludge is torn away on cutting blade at end of filter. Filtration down to 10 microns is obtainable. (Industrial Filters Co.)



For more data circle No. 40 on postcard, p. 157

Standard-Size Pallet

In standard size, a corrugated all-steel welded pallet is reinforced by center braces for extra-heavy duty. It has four-ways entrances for fork trucks. Standard sizes are in both single- and double-face design, 48 x 40 in. and 48 x 48 in. (Palmer-Shile Co.)

For more data circle No. 41 on postcard, p. 157

Thermostat

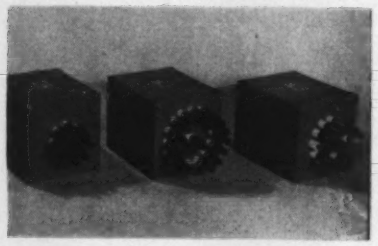
Reliable in operation, a thermostat is a miniature-size, differential expansion type control. It has eight standard ranges up to 1150°F. The thermostat incorporates a snap-action switch rated 5 amp, 125-250 v ac, 30 amp 30 v dc. Temperature settings are made with internal adjusting screw. Units are for local mounting and may be furnished

with flanged or threaded fittings. (Burling Instrument Co.)

For more data circle No. 42 on postcard, p. 157

Igniter Control

A new multi-burner igniter control automatically fires-up a network of gas burners in ovens, furnaces, boilers and heat-treating systems. Features include: high-speed ignition and its long-life positive contact - wiper switching design

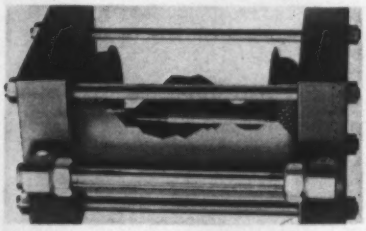


which eliminates arcing gap and wasted energy. Standard units are for operation at 5 or 6000 v. Units can be mounted in any position. The units are: 6-in. wide x 6-in. deep x 8-in long. (Protection Controls, Inc.)

For more data circle No. 43 on postcard, p. 157

Permits Smooth Flow

For the company's air-oil tanks used in booster-equipped cylinders or machines, a bell-shaped steel-mesh baffle permits oil or fluid to enter the tank or be discharged quickly, without any turbulence. This results in a smooth, laminar



flow of the oil or fluid in the tank, eliminating fog. Another distinctive feature of the tank is a gage which gives .quick, easy reading of the exact oil level within the tank. (S-P Mfg. Corp.)

For more data circle No. 44 on postcard, p. 157

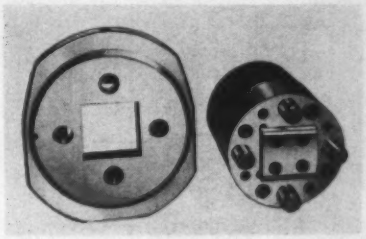
Ball-Point Marker

In a 6- x 1-in. tube, an easy-to-use ball point marker, color codes, numbers and marks on smooth or rough surfaces of metal, wood, plastic and glass. The special, fast drying, chip-proof inks withstand heat and weathering under adverse conditions. They will not peel, fade or rub off. Three different size ball points come in twelve colors. (John P. Nissen, Jr., Co.)

For more data circle No. 45 on postcard, p. 157

Shear-Proof Punch

Punching, notching and trimming steel, and all light- and medium-gage materials up to 0.125-in. thickness, without shearing, is possible by using a shear-proof punch. Punch and die are kept in precise alignment at all times by high-ten-

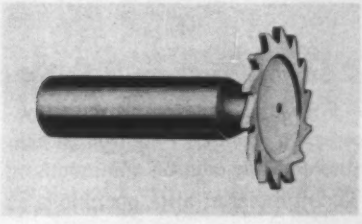


sion, spring-loaded alignment pins. In operation, the pins will retract to allow for work piece. The unit is made of tool steel, and is precision ground and bored. (Anetsberger Bros., Inc.)

For more data circle No. 46 on postcard, p. 157

Slotting Cutters

Narrow-width slotting cutters are recommended for narrow slotting or slitting operations, where a shank-type cutter is preferable to an arbor type saw. The slotting cutters can be set up faster and are ideal for cutting slots, grooves, and recesses



into inside diameters, cavities, pockets, and recessed areas. (For free copy write on company letterhead to Quality Tool Works, 322 S. Elmwood Ave., Waukegan, Illinois)

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WITH A LAMSON AUTOMATIC PALLET LOADER

Gauged to handle any flow

Designed logically to receive the stepped-up mechanized flow of packaged goods from high speed production lines, the LAMSON AUTOMATIC PALLET LOADER provides the perfect link between packaging and warehousing.

Fast, accurate and dependable, the LAMSON AUTOMATIC PALLET LOADER performs a complex and variable operation for long periods of time with minimum maintenance.

Initial cost may be amortized out of savings the LAMSON AUTOMATIC PALLET LOADER effects in reducing man hours per pallet load and damage or breakage to packages.

Write for THE AUTOMATIC PALLET LOADER catalog. It may well be the answer to your particular materials handling problem. Or, simply clip this advertisement to your letterhead and mail to:

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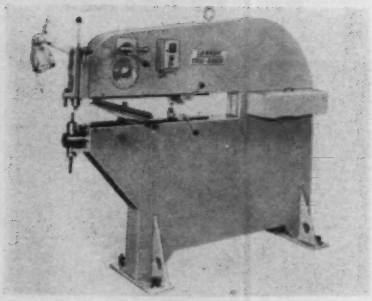
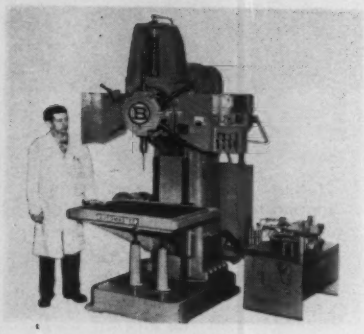


Machine Has All Controls on One Side

A shearing, forming, and piercing machine cuts in the center of ¼-in. mild steel plate without a starting hole. The machine operates with a reciprocating upper and stationary lower tool. The unit has a cutting speed of up to 36 fpm, with number of cuts per minute from 1750 to 3500. It cuts straight, circular, inside or irregular shapes, slots and louvers. The machine also performs beading, planishing, flanging, edge bending, joggling, nibbling and hole-piercing operations. The machine cuts circles up to 48-in. diam. (Lennox Tool & Machine Builders)

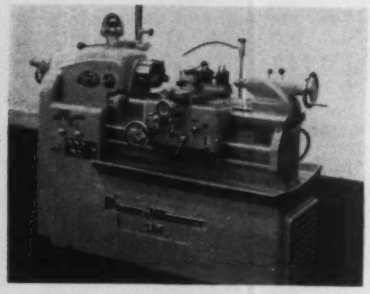
For more data circle No. 47 on postcard, p. 157



Turret Drill Has a 1¼-in. Capacity in Steel

Without guide bushings, an automatic hydraulic turret drill reams, drills, taps, bores, counterbores, spotfaces, and port cuts. Driven with 7½ hp, the machine has a speed range of 90-3000 rpm; throat depth is 17-3/16 in.; turret travel 10 in. This heavy-duty drill introduces many individual features: constant-positive hydraulic feed with dial set; direct-reading electrical feed indicator; insured accurate feed rates under all conditions; increased turret rigidity during heavy machining operations; fast setup and quick changeover for short-run production. (Burg Tool Mfg. Co., Inc.)

For more data circle No. 48 on postcard, p. 157



Production Lathe Delivers Fine Finishes

Rigidly constructed, a 10-in. production lathe removes metal fast, and takes the heaviest cuts with ease. A single-lever control starts and brakes the spindle, and opens or closes the air-operated chuck. Operating pressures for the chuck itself are infinitely adjustable from 0-22.5 psi. There are nine forward and reverse speeds, and nine longitudinal and transverse feeds, affording the right choice for any type of cut in any metal or alloy. Speed and feed controls are color coded for fast, easy selection of the correct combinations. (Pratt & Whitney Co., Inc.)

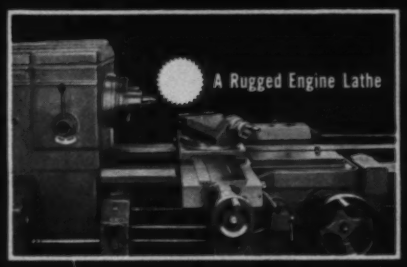
For more data circle No. 49 on postcard, p. 157

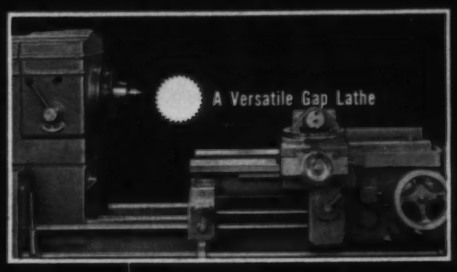
Control System is Subject to Single Responsibility

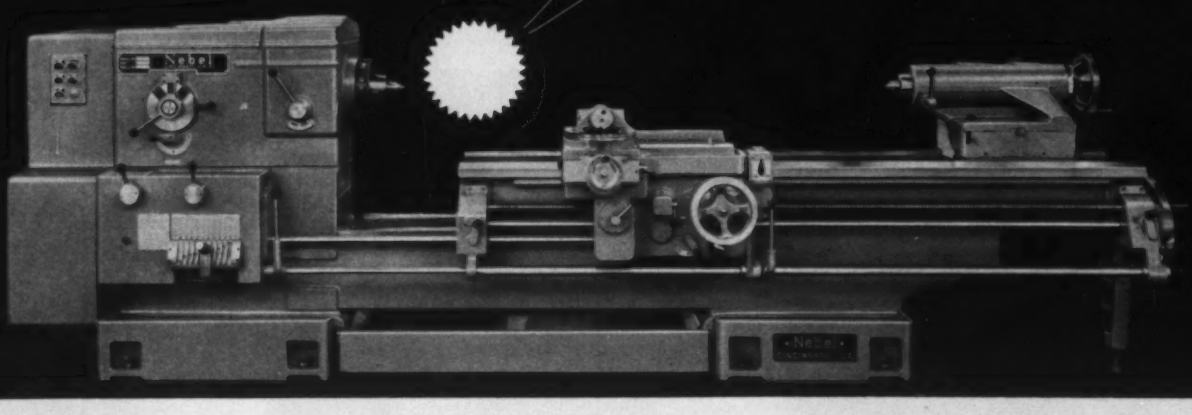
For large-scale industrial processes, a computer-control system automatically controls continuous or batch processes; also, operations as complex as entire plants or systems. The heart of this control system is a digital computer. High-speed computation, concurrent with input and output operations, makes the computer ideally suited for on-line computation and control, and monitoring. For on-line monitoring and control of industrial processes, the high computation speed permits frequent system checks and closer control of process variables. Data handling and control of processes in steel plants is one of the many uses of the control system. (Minneapolis-Honeywell Regulator Co.)

For more data circle No. 50 on postcard, p. 157

DOUBLE PURPOSE







NēBEL

HEAVY DUTY
EXTENSION BED GAP LATHE

Now Nebel brings to the heavy duty field the unique benefits of the extension bed gap lathe. The new, proven design, Model HXB 26/45 provides 26½" diameter swing over the upper bed, 46" diameter swing through the gap and 48" to 84" adjustable centers in base length. Built to complete A.S.A. standards for engine lathes it's truly heavy duty in every component part and in turning capacity.

And, significantly, Nebel, with its established economy offers the HXB 26/45 at a price competitive to standard engine lathes. In effect you get 2 heavy duty lathes for the price of one, thereby reducing your capital investment. *Write for new descriptive Bulletin No. 211*

NēBEL LATHE DIVISION, NEBEL MACHINE TOOL CORPORATION
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ACTUAL X-RAY PHOTO* OF TRI-CLAD '55' 7½ HP MOTOR

GENERAL ELECTRIC

Exclusive General Electric Thermo-Tector† System Eliminates Overload Burnouts

ALLOWS MAXIMUM MOTOR OUTPUT— SAFELY!

Now—Tri-Clad '55' motors have simple, direct-acting thermal protectors that positively prevent overload failures!

New Thermo-Tector heat-sensing switches buried in motor windings react *instantly* to prevent heat damage. Unique Thermo-Tector "anticipation" feature varies motor shutoff point according to rate of winding heat rise. This ends need for operating safety margin, allows you to get *full output* from Tri-Clad '55' motors.

Thermo-Tector system requires *no costly amplifying relays*—works with any conventional G-E motor controller. Thermo-Tector protection is available on *all* Tri-Clad '55' motors in frames 254U-445U.

For more information, contact your General Electric Apparatus Sales Office or write for Bulletin GEA-7092, Section 866-01, Schenectady 5, New York.

*Photo made from radiograph taken with 1,000,000-volt G-E Resotron® X-ray machine at General Electric's Large Steam Turbine-Generator Department.

†Trade-mark of General Electric Company.

SMALL AC MOTOR & GENERATOR DEPT.

GENERAL ELECTRIC

SCHENECTADY 5, NEW YORK

NEW EQUIPMENT

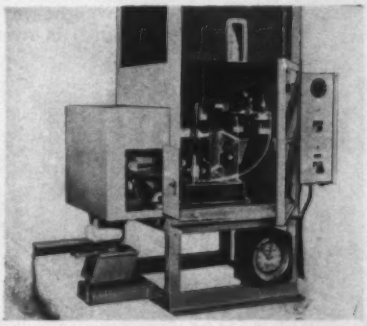
Fork Truck

Capable of lifting 35 tons, a general-purpose lift truck is 12-ft high over the cab, 29-ft long (without forks), and 11-ft wide. Its four tires are 74-in. high. A six-foot tall man can stand upright under the rear deck of the machine. With construction-type pneumatic tires and four-wheel drive, the truck is designed for especially heavy lifting work at steel yards, steel erection sites, lumber mills and similar outdoor operations. (Clark Equipment Co.)

For more data circle No. 51 on postcard, p. 157

Continuous Weighing

For high-precision continuous weighing of loose, free-flowing granular solids, a continuous weighing machine introduces a new and improved system for inserting dry additives into processing lines. The lines may be operated by conveyor,



pipeline or other continuous-flow methods. Fully automatic in operation, the unit's design permits the handling of a wide variety of different products in quantities from 1 oz-3 lb and 3-10 lb. (The Exact Weight Scale Co.)

For more data circle No. 52 on postcard, p. 157

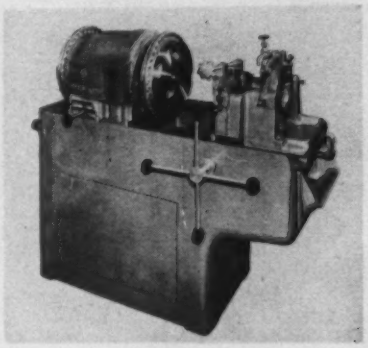
Bench Welder

With air-press operation and an electric foot switch, a bench welder has a squeeze-weld timer that permits the electrodes to compress the work before welding. This allows for much finer control of the operation. The welder measures 15 in. in height, 8½ in. in width, 9 in. in length and weighs 90 lb complete. It has a 1-in. diam cylinder and a 1-in. stroke, and is capable of 0-100 lb pressure. (Alphil Spot Welder Mfg. Co.)

For more data circle No. 53 on postcard, p. 157

Pipe and Bolt Machine

A 4-in. pipe and bolt machine features wrenchless chucks, four speeds and throw-out fixtures so that it can be used as a makeup machine. It is light-weight so that it can be moved to job site (weighs



only 980 lb and can also be trailer mounted). The machine can thread 1- through 4-in. pipe, using only two dieheads and two sets of dies. (Beaver Pipe Tools, Inc.)

For more data circle No. 54 on postcard, p. 157

Flaring Tools

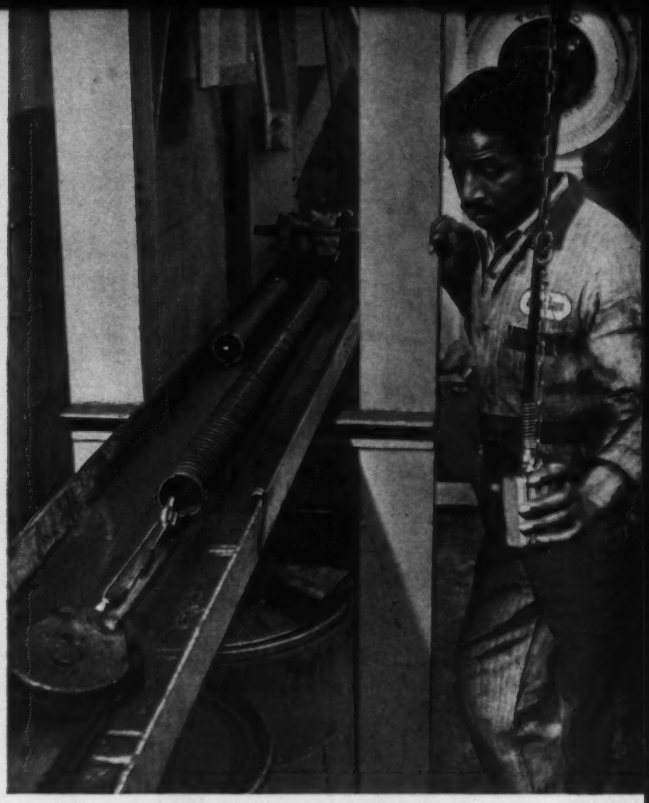
Ruggedly built to precision standards, flaring tools produce uniform 45° or 37° flares quickly and easily on copper, aluminum and brass tubing. All working parts are locked together so that they cannot become separated and lost. Hinge and aligning pins lock yoke, die bars and tubing into exact alignment. Bottom of yoke automatically gauges flares for uniform length. (The Ridge Tool Co.)

For more data circle No. 55 on postcard, p. 157

Buffing Lathe

For high-production finishing operations, an adjustable triple-head buffing lathe provides three buffing operations in a minimum amount of floor space. The buffing lathe is ideally suited for use with automatic high-production, straight-line buffing machines where a large number of buffing heads are required for finishing parts. The adjustable lathe is equipped with

D. C. Forry, sales manager for Ridge Door, left, shows Pittsburgh Steel Salesman Robert Hogan how each spring is tagged, indicating pounds pull to assure that the proper weight garage door is matched with the proper springs.



Testing a 25-inch long extension spring to determine the pounds pull required to extend the spring to 67 inches. Engineering formulas tell workers what weight springs will balance each door. Correct pounds pull is marked on tag which is fastened to spring

How Pittsburgh Steel's Wire Helps A Door Man Keep His Balance

Ridge Door Company Uses Oil Tempered Spring Wire From Pittsburgh Steel Company To Coil Extension And Torsion Springs Which Balance Garage And Industrial Doors Within Five Pounds

It takes an even temper to make a garage door.

For Ridge Door Company of Monmouth Junction, N.J., "even temper" means dependable uniformity in oil-tempered spring wire it gets from Pittsburgh Steel Company.

Garage doors are deceiving. Doors identical in style and size can vary as much as 30 pounds in weight due to the wood's moisture content and other factors. Yet the springs which open and lower doors with mere finger-tip pressure must be in near perfect balance.

Uniformity of Pittsburgh Steel's oil-tempered spring wire enables Ridge Door, a division of Muskegon Motor Specialties Company, to match individual doors to springs whose pull is within five pounds of the door's weight. Here's that story:

The matching process begins with completion of the wooden door, made of high altitude, kiln-dried hemlock or Douglas fir. Each finished door is weighed carefully and tagged to show its weight.

Meanwhile in the Spring Department springs are being coiled according to engineering formulas which take into account door weights, drum diameters and other factors. After coiling, each extension spring is tested to determine the number of pounds pull required by extending it a specified number of inches. This pull is machine stamped on a tag which is fastened to the tested spring.

For example, a 25-inch spring is extended to 67 inches and the pounds pull is automatically recorded.

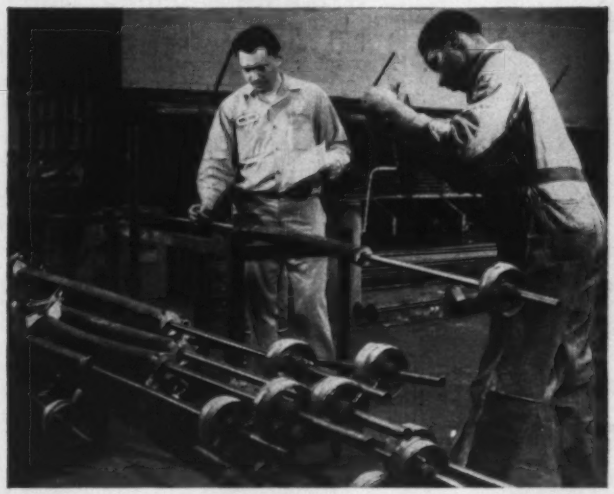
Engineering formulas tell the workers what weight springs to match with different doors. As a result, Ridge Door is able to assure its customers that doors will be in balance within five pounds.

Uniformity of oil tempered spring wire makes this precision work possible. Springs coiled from Pittsburgh Steel wire can be depended on for consistent performance.

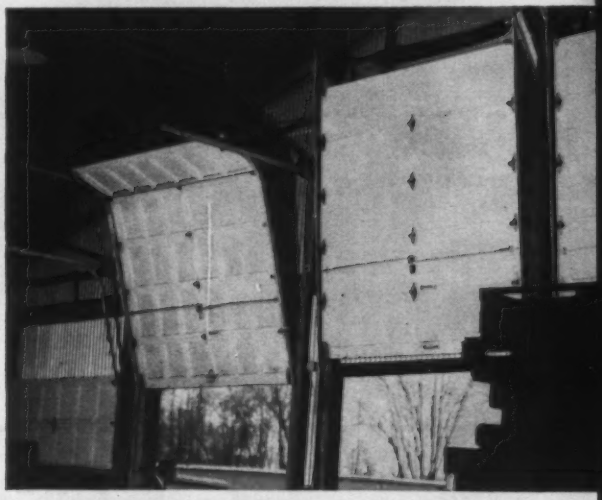
Coiling up to five tons of springs a day provides a tough test which

Uniform diameters and freedom from hard and soft spots speed spring coiling in the Monmouth Junction, N.J., plant of the Ridge Door Co. Division of Muskegon Motor Specialties Co. Pittsburgh Steel Co.'s oil tempered spring wire helps Ridge Door match springs to doors so precisely that finished product is in near perfect balance.

After coiling, springs are loaded into a two-unit, gas-fired furnace for heat treating. Springs are stress relieved for an average of 45 minutes at 475 degrees F. to achieve desired physical characteristics.



Assembling torsion springs on shaft. Each of these shafts will get two springs for use in raising a 16 by 7-foot double garage door. The springs shown here are coiled from wire .263 inch in diameter. The finished springs each have 120 coils. Drums and cables already are assembled.



A combination of high lift and vertical lift industrial doors produced with springs coiled from Pittsburgh Steel Co. wire is shown here. The installation is in the New Brunswick, N. J., warehouse of the Herman Forwarding Co.

Pittsburgh Steel wire passes.

Carmen Pellino, foreman of the Spring Department, puts it this way:

"We must have wire with uniform diameters, free from kinks as well as hard and soft spots.

"Variations in diameter prevent proper coiling since the wire will not pass through the rolls on the coiling machines properly. Soft and hard spots produce uneven coils and affect spring performance. We have found springs coiled from Pittsburgh Steel wire coil without trouble and perform well in service."

Other users of the wide range of wires for industry produced by Pittsburgh Steel get similar advantages. For improved production and greater customer satisfaction, call one of the district offices listed below. Real help is as close as your phone.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio

floating heads operated by individual air cylinders to maintain uniform part buffing pressure. (Acme Mfg. Co.)

For more data circle No. 56 on postcard, p. 157

Arc Ruler

Arc rulers provide the draftsman with a rapid and accurate means of drawing arcs of circles of large radii. The rulers are used to draw arcs of circles of any radius from 7-200 in. or more with ease; even if the center point of the circle is beyond the edge of the drawing surface. This new tool eliminates the need for french curves, ships curves, splines and weights and other tedious tools in drawing arcs. (Fullerton Engineering Sales Co.)

For more data circle No. 57 on postcard, p. 157

Air Mover

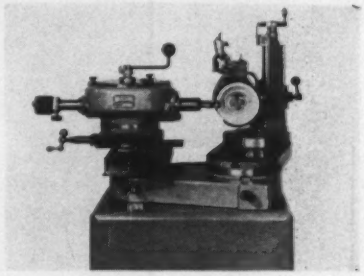
Highly efficient, an air-moving device exhausts welding fumes and smoke from closed work areas. The unit is comprised of a special intake nozzle joined to a jet pump casting by a length of flexible tubing. From this point, smoke is exhausted through another connecting section of tubing to any discharge point.

Operation requires merely connecting it to an air line positioned to carry the smoke and fumes away from the work area. By directing a current of air out, it draws fresh air into the work area. (Arcair Co.)

For more data circle No. 58 on postcard, p. 157

Grinding Machine

A grinding machine quickly and easily grinds a wide variety of cutting tools. Some of them are: standard end mills, fast spiral end mills, taper end mills, taps, reamers, counterbores, core drills, step drills, angle cutters, "T"-slot cutters and many other cutting tools. In addition, the grinder can make end mills, step drills, drills, reamers and counterbores plus all end-cutting tools, spiral or straight fluted, ground from the solid. (Spiral Step Tool Co.)



For more data circle No. 59 on postcard, p. 157

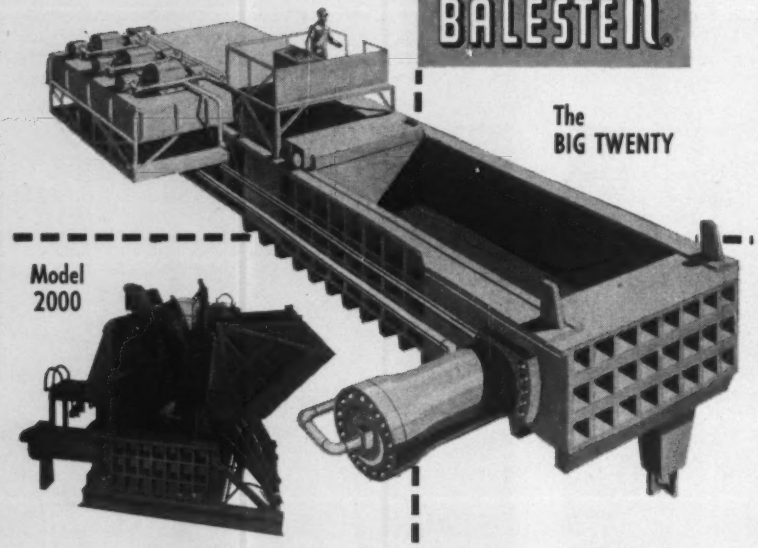
Small-Parts Conveyor

Six-feet long, a 6-in. wide neoprene belt conveyor has a special gearhead motor and "start-stop" switch. The ½-in. high solid rubber neoprene cleats are molded onto the conveyor belt. Sides are enclosed and the bottom is equipped

America's Most Complete Line of High-Speed Baling Presses

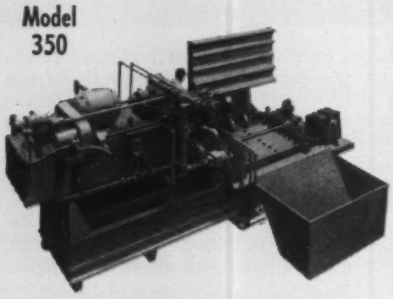
DEMPSTER BALESTER

The BIG TWENTY

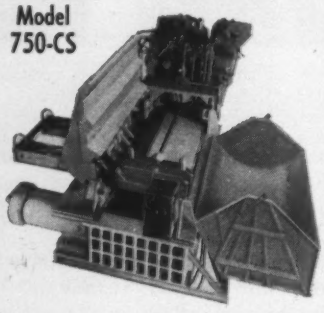


Model 2000

Model 350



Model 750-CS



Cut scrap-metal baling time and costs with a high-speed, low-investment DEMPSTER-BALESTER. You buy the power and capacity you need . . . plus dependability . . . when you choose from the many models in America's most complete line. Write for free catalog on the new 750-CS.

DEMPSTER BROTHERS Inc. KNOXVILLE 17, TENN. DEPT. IA-7

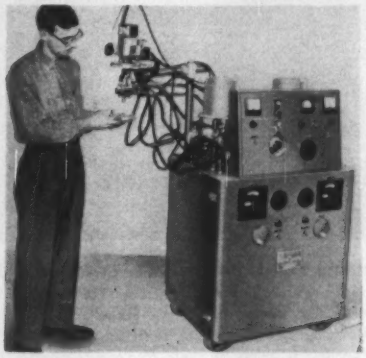
with a tray to catch any spillage. The face of the belt is covered by a Plexiglas shield and the return belt is enclosed in a metal casing. A steel

hopper is equipped with a rubber flapper to prevent loss of parts and is attached to the lower end. (Sage Equipment Co., Inc.)

For more data circle No. 60 on postcard, p. 157

Produces Foam

Producing polyurethane foam, a machine is capable of pumping, metering and mixing two-component formulations for rigid, semi-rigid, or flexible foams. The throughput is variable from 0-2 lb per minute. With the self-cleaning, on-off mixing device, shots of mixed materials

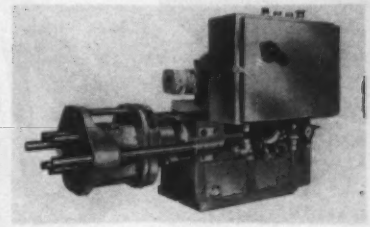


can be accurately proportioned, dispensed, and reproduced in quantities of a few grams to continuous pours. The unit measures only 33 x 26 in. with an overall height of 52 in. (The Martin Sweets Co., Inc.)

For more data circle No. 61 on postcard, p. 157

Tapping Unit

Utilizing the "lead screw" principle, an automated tapping unit enables pitch change with one rugged lead screw. The result is highly-accurate threads. Tapping pitch is changed by changing only



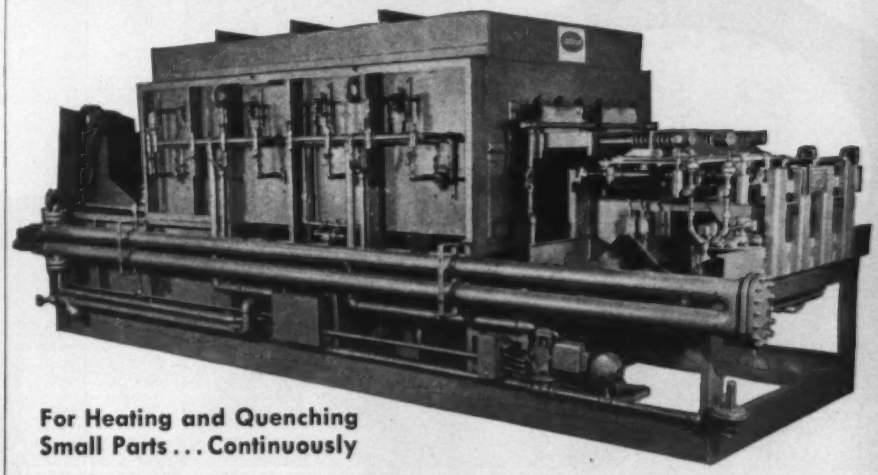
one gear at the back of the unit. The unit is completely self-contained and may be mounted in any position from vertical to horizontal. (Thriftmaster Products Corp.)

For more data circle No. 62 on postcard, p. 157

Sintering Furnaces

Box-type sintering furnaces sinter and impregnate precision parts compacted from iron, iron-graphite, iron-copper, iron-graphite-copper, as well as copper, bronze, brass, and steel powders. Any inert, reducing, or non-decarburizing atmosphere can be used including hydro-

THE NEW Sunbeam SHUFFLE HEARTH FURNACE



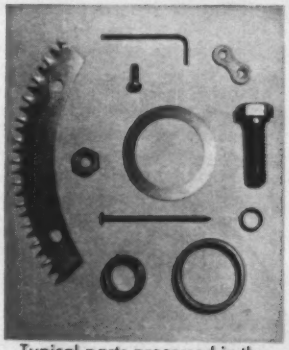
For Heating and Quenching Small Parts . . . Continuously

Now You Can Increase Production, Improve Quality, Reduce Labor

The all new Sunbeam Shuffle Hearth Furnace is designed for production heating and quenching of parts such as those illustrated to the right. Parts similar to these must be processed in quantity to be economical and the finished pieces must be of uniform high quality. The Sunbeam Shuffle Hearth is made to order for these requirements.

Automatic heat treating and quenching make this furnace easy to operate. Only a minimum of supervision and maintenance is needed.

From the sizes available, you can select just the right unit—for maximum production at minimum cost. Choose any size and you will get the savings of a standard unit. Sunbeam Shuffle Hearth Furnaces are already engineered. They can be built, delivered and installed in a short period of time.



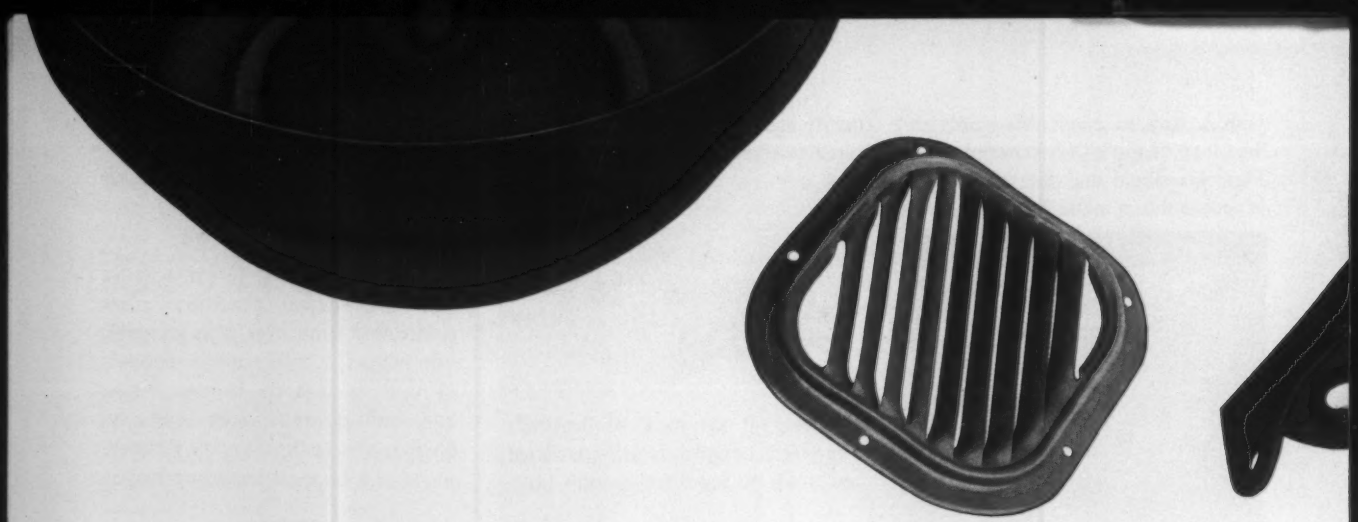
Typical parts processed in the new Sunbeam Shuffle Hearth

SEE IT IN ACTION SOON. *To see this new furnace in action we invite you to visit our Meadville plant where we have a production unit in operation. To arrange for a visit or further information, call or write: Mr. Jonathan Smith, Project Manager.*

Sunbeam

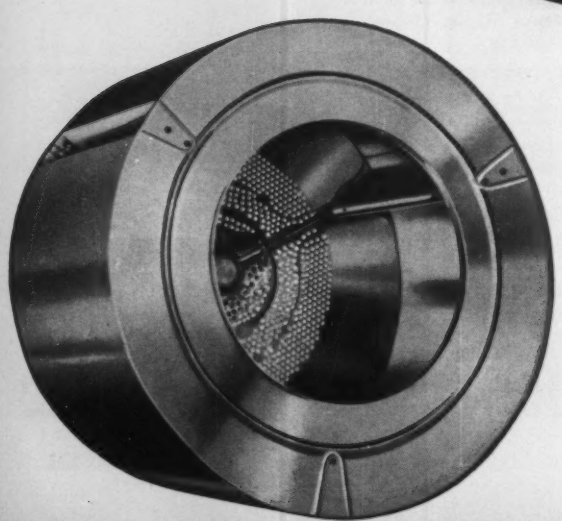
SUNBEAM EQUIPMENT CORPORATION

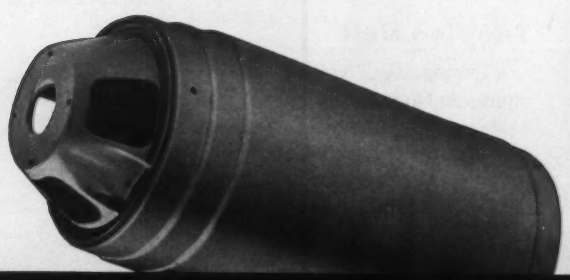
200 Mercer Street **Meadville, Pennsylvania**



REPUBLIC PUTS THE "ABILITY"

EXCELLENT PAINT-GRIPPING surface characteristics and corrosion-resistance of *Republic Electro Paintlok®* are not affected by forming operations. Produced by electro-galvanizing, plus a chemical treatment, Electro Paintlok not only holds paints, lacquers, and enamels better, but has an exceptionally smooth surface that results in finished, painted products with more eye appeal. Mail coupon for more information.





IN FORM-ABILITY

Sheet steel for the "shapes of the sixties." Steels with greater formability—to take sharp, acute angles, and never crack or flake—to withstand deep drawing operations, and hold their strength and performance properties—to cut clean, be punched and perforated—to retain their corrosion-resistance—to undergo extensive fabricating, and come up shining-bright.

Steels to meet all your fabricating requirements. Formability that gives you new design flexibility. Uniformity and quality you can depend on. Republic Sheet Products. Included are hot and cold rolled carbon, alloy, stainless, high-strength and titanium. Also a full line of coated sheets.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

DEEP DRAWING of *Republic* ENDURO® *Stainless* illustrates the exceptional formability of versatile ENDURO. Highest uniformity and quality of Republic Stainless assure satisfactory performance with all types of fabricating techniques—blanking, shearing, punching, drawing, spinning, shrink and stretch forming. ENDURO is offered in many types and finishes to meet your exact requirements. For more data, mail coupon.

SHARP BENDS, FLANGING, seaming—ductile zinc coating on *Republic Galvannealed Sheets* stays tight, resists flaking, peeling, or spalling. Hot dip galvanizing plus special heat treatment give Galvannealed a graduated coating of iron-zinc alloys between the pure zinc outer surface and the base metal. The tough, uniform protective finish is spangle-free, provides a good paint base, withstands temperatures up to 750°. Send coupon.

MASS PRODUCTION FORMING processes do not damage the uniform, tight zinc coating of *Republic Continuous Galvanized Sheets.* This product is ideal for applications where corrosion-resistance and low initial cost are considerations. Zinc coating won't crack, flake, or peel under any forming process permitted by the base metal. Costly dipping after fabrication is eliminated. To get more information, send coupon.

USE THESE STEELMARKS of the American Steel Industry to identify products you make of steel, stainless steel, or galvanized steel. STEELMARK stickers and tags are available in any quantity you need. Mail coupon for complete, information on ordering.

REPUBLIC STEEL CORPORATION
DEPT. IA-9374-A
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send additional information on the following:
- ☐ Galvannealed Sheets
- ☐ Electro Paintlok Sheets
- ☐ Republic ENDURO Stainless Steel Sheets
- ☐ Continuous Galvanized Sheets
- ☐ American Steel Industry STEELMARKS

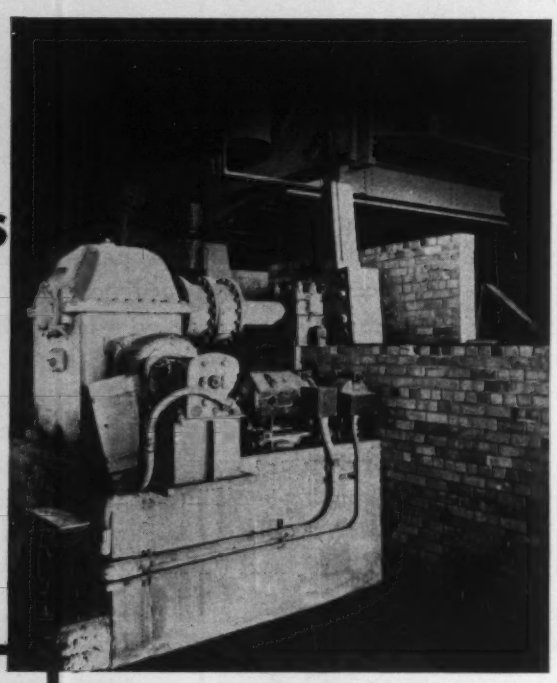
Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____

Tilting 700-tons of steel furnace

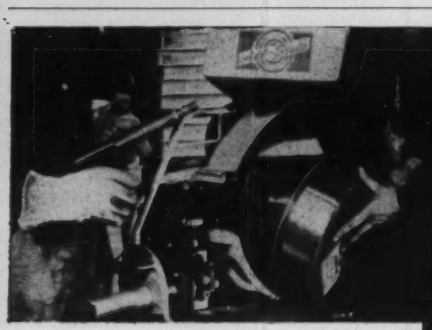


CONE-DRIVE GEARS

DIVISION MICHIGAN TOOL CO.
7171 E. McNichols Rd., Detroit 12

Here's a closeup of tilting mechanism for an electric furnace. Standard, stock model, double-reduction Cone-Drive **double-enveloping worm** gear speed reducer tilts furnace and heat with combined weight of 700 tons.

Powerful Cone-Drive gearing is available in gearsets, speed reducers and gearmotors.



Loading 10 lb. spool of #4043 aluminum wire at Michael Flynn Manufacturing Co., Philadelphia. Aluminum in this particular spool was used in welding curtain walls for skyscraper at 2 Broadway, New York City.

now you can get
All-State Spoolarc

SPOOLED ALUMINUM

in all grades, all types
precision layer level
wound on
1 lb. and 10 lb. spools

Wire goes from extrusion and light draw to ALL-STATE'S precision spooling machines where it is layer level wound for smooth, trouble-free welds.

Types available: 1100, 4043, 5052, 5154, 5183, 5356, 5556, 6061, 6063, *355,* 356, 716, 718.

Precision spooled in these sizes: .030, .040, 3/64, 1/16, 3/32, 1/8.
*down to 1/16 only

ALL-STATE *Spoolarc*® spooled aluminum wire meets federal and industry specifications. Spools are sealed in polyethylene bags plus desiccant to retain top quality from spooling machine to welding machine.

Complete stocks available from factories at White Plains, N. Y. and South Gate, California . . . and from branches at St. Louis, Missouri and Toronto, Canada. On sale at over 1000 distributors here and abroad.

Send for new free Aluminum Manual.

Distributor-Stocked, convenient to buy. Economical to use.
ALL-STATE WELDING ALLOYS CO., INC., White Plains, N. Y.
Call WHite Plains 8-4646 or write for nearest distributor

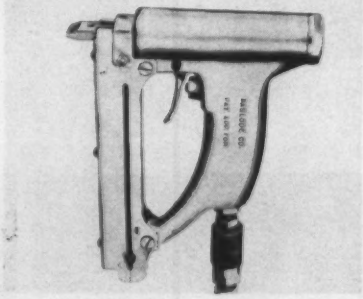
NEW EQUIPMENT

gen, dissociated ammonia, endothermic and exothermic gases. In the burnoff chamber, nickel-chromium elements provide temperatures up to 1500°F. Inside the high-temperature chamber, parts can be processed at temperatures up to 2350°F. (Harper Electric Furnace Corp.)

For more data circle No. 63 on postcard, p. 157

Air-Power Stapler

Well-balanced, a pneumatic stapler contains a high-speed nylon piston for fast, recoilless action and improved work quality. A light touch of the trigger drives the staple home from any angle. Costly down-time and production-line delays are greatly reduced with the jet-drive

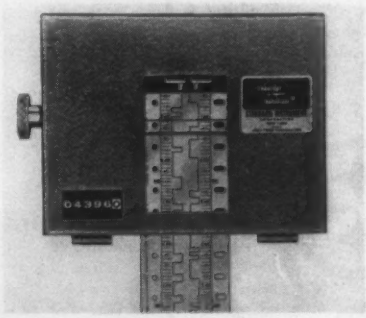


air return. This air return eliminates parts failures, extends the life of the tool, and insures positive action and quality stapling. The stapler takes both standard and wide-crown staples, with leg lengths of 3/16, ¼, and ⅜ in. (Signode Steel Strapping Co.)

For more data circle No. 64 on postcard, p. 157

Time Recorder

A time recorder records and compares productive time of plant



and office equipment. The two-channel recorder graphs at the

Another example of National Roll quality control

Deac Scholl, sales manager at National, discusses steel roll machining with Joe Rebar, right, roll shop superintendent.

Contour machining gives more precise shaped rolls

Some of the most impressive equipment installed in National's roll shop are the large contour lathes. Some of the largest ever made, these lathes faithfully follow the lines of carefully made templates in machining grooved steel rolls for the shaping of steel beams, rails and a multitude of other end products.

Lathes, grinders and other roll shop equipment at National have been selected specifically for the finishing of steel, iron and nodular iron rolls. A walk through this shop will convince you of the emphasis placed on quality in this phase of National's roll production.

We'd like to have you visit our modern roll producing plant at Avonmore. Failing that, we'll be glad to send you a new brochure which describes our new facilities, one of the reasons that...

National's the growing name in rolls

NATIONAL ROLL & FOUNDRY DIVISION

GENERAL STEEL CASTINGS CORPORATION, Avonmore (Westmoreland County), Pa.

General Steel Castings Corporation, General Offices: Granite City, Illinois • Plants: Granite City, Ill., Eddystone, Pa., Avonmore, Pa.

SET YOUR LINE WITH EXTRA SALES-BAIT...

APPLIANCES • FARMYARD PRODUCTS • AUTOMOTIVE PARTS • BUILDINGS

Today's value-minded consumers demand products that give bonus years of useable service. That's why merchandising-minded manufacturers of appliances, farm equipment, automotive parts, metal buildings, and other products where corrosion-resistance is of prime importance, are using TI-CO galvanized sheets and their brand acceptance as a *plus sales feature.*

This is because TI-CO has earned the reputation of being a quality standard. This durable, uniform galvanized sheet gives your product components assurance of long life . . . helps them fulfill their original function and keep their fine appearance longer. Whether your product calls for deep-drawing, spinning, punching, crimping, perforating, Pittsburgh lock-seaming . . . *you won't flake TI-CO!*

Use the TI-CO brand, indicating *proven corrosion-resistance,* to provide an important competitive edge whether you're selling a component or a finished product.

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use TI-CO® galvanized steel sheets

INLAND

PHOTOGRAPH BY BEN SPIEGEL

RUSS VANDEN BERG GIVES ALUMINUM A THOUSAND FACES

Aluminum is the natural ally of the designer and the salesman. For the one, no other metal can mirror his imagination so faithfully. For the other, no other metal can wear so many colors and textures to stir his prospect's impulse to buy.

Russ Vanden Berg knows which of aluminum's thousand faces will improve the looks and performance of your product. He can recommend a tough and colorful finish that guards fishing reels against corrosion for life. A super-hard coating that minimizes wear and erosion on impellers. A durable, reflective surface for ball park floodlights. He can simulate top grain cowhide on a camera case . . . put the sparkle of gold on your office building.

Only aluminum can be treated so many ways, so beautifully. Russ and his 28-man crew in the Finishes Section of Alcoa's Process Development Laboratory are prepared to show you *how*. It's another extra value you get with every pound of Alcoa® Aluminum you buy.

Aluminum Company of America, 2018-G Alcoa Building, Pittsburgh 19, Pennsylvania.

ALCOA ALUMINUM

helps you design it, make it, sell it

Alcoa has hundreds of Russ Vanden Bergs to help you design it, make it, sell it

All of Alcoa's skills are mobilized to a single purpose: To put more than just 16 ounces of metal in every pound of Alcoa Aluminum you buy. Here are 12 of the dozens of ways to do it:

1. Research Leadership, bringing you the very latest in aluminum alloys and applications.

2. Product Development by specialists in your industry and your markets.

3. Process Development Labs for aid in finishing, joining and fabricating.

4. Service Inspectors to help solve production problems at your plant.

5. Quality Control to meet top standards or match your special needs.

6. Complete Line including all commercial forms, alloys, gages, tempers.

7. Availability via the nation's best stocked aluminum distributors.

8. Foremost Library of films and books to help you do more with aluminum.

9. Trained Salesmen with a wealth of on-the-spot information.

10. Sales Administrators constantly on call to service your orders.

11. Year-Round Promotions expanding your old markets, building new ones.

12. The Alcoa Label, leading symbol of quality aluminum, to mark your goods.

Added Values With Alcoa Aluminum

. . . is a case book of Alcoa special services and a guide to their availability in design, manufacture and sales. Your copy, with some of the most rewarding information you may ever read, is waiting and it's FREE. Write: Aluminum Company of America, 2018-G Alcoa Building, Pittsburgh 19, Pa.

NEW EQUIPMENT

same time, on a single strip chart, the operating patterns of two machines, two functions of the same machine, or any two processes. A built-in time totalizer continuously furnishes a visual sum of productive time in hours and tenths, or minutes and tenths. (Standard Instrument Corp.)

For more data circle No. 65 on postcard, p. 157

Rolling Mill

A rolling mill easily handles runs from the softest annealed thin-gage nonferrous metals to the ultra-hard exotic metals. The mill rolls high-carbon steel from thicknesses of 0.070 in. down to 0.005 in., holding tolerances of ±0.0001 in. on finished size. Usual material is 6- to 7-in. wide and is normally rolled at 500 fpm. Coils run up to 230 lb per inch of width. (H. J. Ruesch Machine Co.)

For more data circle No. 66 on postcard, p. 157

Helical-Path Analyzer

For analyzing threads, a measuring instrument analyzes both linear and "drunken" deviation from the true helical path of thread plug gages or similar precision threaded parts. It can check deviations to an accuracy of 0.00003 in. over three revolutions on external precision threads. The results are recorded graphically on a chart recorder. Indexing is continuous and automatic. (Pratt & Whitney Co., Inc.)

For more data circle No. 67 on postcard, p. 157

Elapsed-Time Computer

In the metal-working industry one of the hardest cost factors to determine is shop order cost information and machine utilization time. An automatic elapsed time-computer provides the metal-working industry with an answer to this problem. It is used either for single-item computation or as an integral component of any planned or existing cost-control system. The elapsed-time computer automatically computes and, at the same time, prints elapsed time, the difference between "start time" and "finish time" of a given operation. (Calculagraph Co.)

For more data circle No. 68 on postcard, p. 157

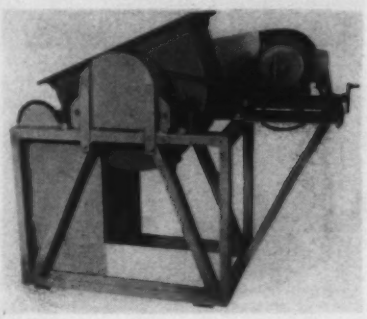
Air Hammer

For riveting, rivet busting, and panel cutting, a heavy-duty air hammer has a beehive spring retainer. This spring retainer permits the cutting tool to rotate. The hammer's metering trigger controls blows from 0-3500 per minute at the touch of a finger. The unit weighs just 3⅛ lb. (Superior Pneumatic & Mfg. Inc.)

For more data circle No. 69 on postcard, p. 157

Parts Finisher

Good de-burring results on small motor housings, where expensive hand finishing was formerly required, are accomplished with a vibratory parts-finishing machine. In addition, the machine finishes small electronic parts and zinc die castings; in 10 pct of the time

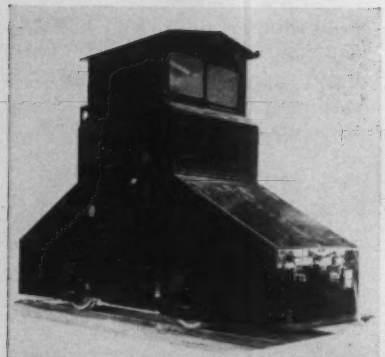


formerly required for these jobs. The finishing medium surrounds the parts at all times. The flow pattern of the medium induces pressure on the parts — pressure that produces a good luster without deformation. (Ultramatic Equipment Co.)

For more data circle No. 70 on postcard, p. 157

Shuttle Kiln

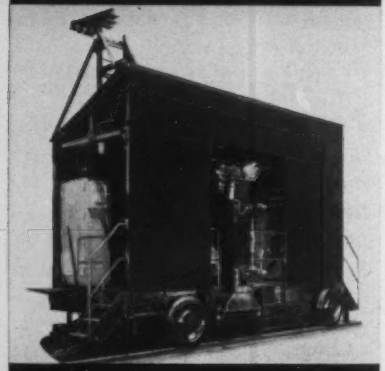
For completely-automatic firing up to 2500°F, a shuttle kiln is particularly adapted to the firing of many types of small ceramic wares, electrical porcelain, and special refractory shapes, using gas or oil fuel. The shuttle kiln can be equipped with a variety of controls, and usually is equipped with a cam-



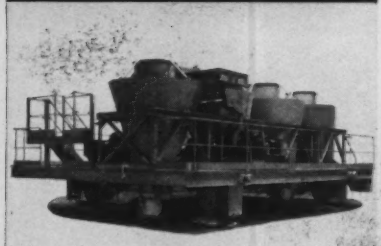
QUENCHER LOCOMOTIVE

COKE ON THE MOVE

Operating economy and long life, again, are major advantages of Atlas equipment for highly specialized coke-producing service. Specially designed and ruggedly built to your exacting requirements.



DOOR MACHINE



COAL LARRY

COKE QUENCHING CAR

Since 1896, Engineers-Builders of Ore Transfers... Scale Cars ... Coke Quenchers ... Coal Larries ... Door Machines ... Safety-Type Transfers ... Storage Battery Locomotives

ATLAS CAR & MFG. COMPANY

1140 IVANHOE ROAD • CLEVELAND 10, OHIO

NEW EQUIPMENT

operated controller for a complete firing cycle. Setting space is 32-in. wide by 50-in. high by 144-in. deep. (Harrop Precision Furnace Co.)

For more data circle No. 71 on postcard, p. 157

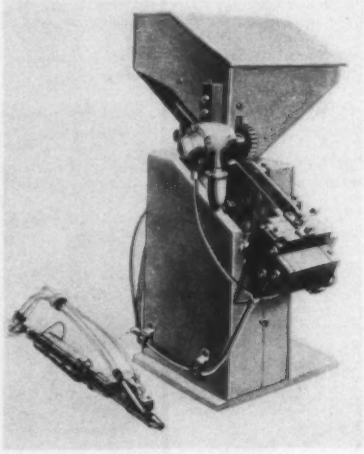
High Oil Filtration

Capable of providing 0.5 or 3.0 micron filtration, a portable filtration unit operates automatically. A signal light provides positive indication that a "change filter" condition exists. Filtering may be accomplished by any one of four modes of operation. (Walter Kidde & Co., Inc.)

For more data circle No. 72 on postcard, p. 157

Screw Feeder-Driver

Adaptable to all standard pneumatic and most electric screw drivers, an automatic screw feeder-driver has a cover housing that protects the inner mechanisms. It is easily portable to any point of the



production line. Adjustable for use with screws of any diameter from numbers 2-14, the unit also quickly converts to any driver. (Parker-Kalon)

For more data circle No. 73 on postcard, p. 157

Car Shaker

A car shaker has an extra-long body, and wide-faced shoes to fit any standard hopper-bottom gondola car. It is balanced to hang level to facilitate centering on car eaves. The 3½-ton shaker is designed for fast, safe, economical

pushbutton unloading of ten cars or more per day of granular material from hopper-bottom gondola cars. (Allis-Chalmers Mfg. Co.)

For more data circle No. 74 on postcard, p. 157

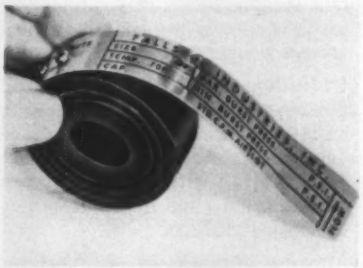
Field Pliers

"Convertible" field pliers may be used for a wide range of internal- and external-type retaining rings. The tool is designed to be used in two ways: to compress internal-type rings for insertion into a bore or housing, or to expand external-type rings for assembly over a shaft. A simple adjustment of the pivot pin on which the two halves of the pliers turn permits the tool to be set so that the tips come together or spread apart when the handles are compressed. (Waldes Kohinoor, Inc.)

For more data circle No. 75 on postcard, p. 157

Rupture Disks

Diameters of 1 and 1½ in. are part of the standard stocked sizes of impervious graphite rupture disks. They come with or without vacuum supports in seventeen burst ratings to 300 lb. The disks are not subject to fatigue, and are un-



affected by all corrosives except a few highly-oxidizing agents. They are immune to the effects of thermal shock, and are non-contaminating. With special insulating assembly, temperatures to 1300°F can be accomodated. (Falls Industries, Inc.)

For more data circle No. 76 on postcard, p. 157

Tank Linings

Extruded sheet in 48-in. wide rolls lines tanks, vessels, and other equipment. These corrosive- and abrasive-resistant rolls cut application costs because more surface area can be covered with a single

Proudly Serving

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WYCKOFF

COLD FINISHED STEEL BARS

Over the years, Wyckoff production facilities have kept pace with the most exacting requirements of all specifications involving: optimum machining properties . . . accuracy . . . outstanding finish . . . controlled physical properties through diversified furnace treatments. For the finest in cold finished steels—SAVE—specify WYCKOFF.

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GENERAL OFFICES: Gateway Center, Pittsburgh 30, Pa.

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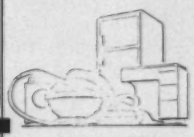
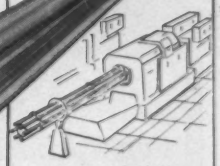
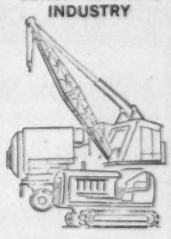
SERVICE CENTERS



APPLIANCES



SCREW MACHINE INDUSTRY



CONSTRUCTION

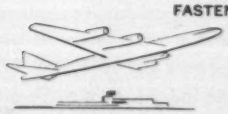
AUTOMOTIVE

RAILROADS

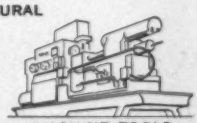
FASTENERS

AGRICULTURAL

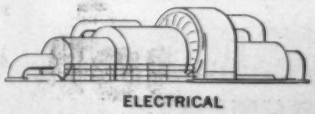
ORDNANCE



AIRCRAFT



MACHINE TOOLS



ELECTRICAL

step up inspection speeds with Branson Sonoray and Sonogate Ultrasonic Flaw-Detection Equipment

Ultrasonic inspection is fast and accurate — even more so with the Branson SONORAY 5 and accessory plug-in SONOGATE Flaw Alarm and its transducer-mounted red signal light. In scanning large areas you look at the CRT only when the visual alarm at your fingertips announces a flaw larger than the critical size you have preselected to trigger the SONOGATE.

Low-frequency penetration coupled with high-frequency sensitivity and resolution . . . smallest size and heft, greatest economy of any high-performance instrument . . . plus the availability of all pulse techniques and a wide range of useful accessories—that's the SONORAY 5 Flaw Detector. Write today for the whole story.

Since 1946—The Respected Name in Ultrasonics

Branson

INSTRUMENTS, INC.

23 BROWN HOUSE RD., STAMFORD, CONN.

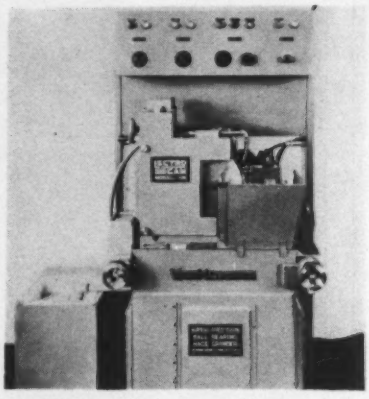
NEW EQUIPMENT

width. This reduces the number of seams and seaming material required, cuts welding time and expense, and speeds installation. (National Vulcanized Fibre Co.)

For more data circle No. 77 on postcard, p. 157

Bearing Race Grinder

A ball-bearing race grinder, grinds inner races of miniature bearings to tolerances of less than 50 millionths of an inch; with about 3 or 4 microinch finish. Industry-integrated design provides high-speed production at lower cost. Advantages of the unit include: machine



stability, which provides accurate temperature control and a minimum of vibration; simplified tooling; exposed grinding; automatic dressing; size compensation; mist control; and detachable tooling which may be bench set. (Van Norman Machine Co.)

For more data circle No. 78 on postcard, p. 157

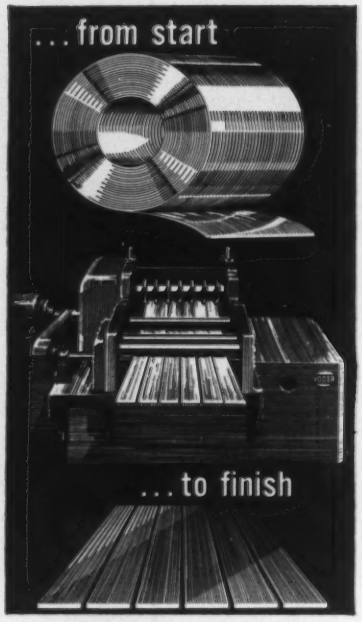
Parts Feeder

Especially designed for the smaller-type parts of less than ½ in. in length, a vibratory parts feeder is complete with built-in control; also, interchangeable bowl of 7-in. diam. Its over-all height is 6½ in., and mounting base is only 8-in. square. The cast aluminum bowl has built-in self-aligning feature. (Burklyn Co.)

For more data circle No. 79 on postcard, p. 157

Inspection System

For production conveyor lines, a low-cost, light sensing electronic inspection system detects and re-



YODER ROTARY SLITTERS

If your slitting requirements call for coil widths from 12" to 60", in gauges from .015" to .250", the economy of purchasing Yoder Slitting Machinery can be yours. Operating a Yoder Slitting Line only one eight-hour shift per week, for example, could easily produce 35 tons of slit strands per week . . . or 1,820 tons every 52 weeks. At a slitting cost saving of only ½¢ per pound, the annual savings would amount to $18,200.

Additional savings can be realized through lowered inventory of mill-width coils—less waiting for delivery of special slit widths. Also, customer satisfaction will increase as you achieve faster completion and delivery of finished products.

At your request a Yoder sales engineer will study your plant operation to determine what equipment would most economically . . . and profitably . . . serve you, whether it be standard components or a completely specialized and engineered line.

Send for Yoder's illustrated text on slitting operations and equipment. It describes methods, time studies, operating cycles, material handling, and gives full specifications.

THE YODER COMPANY

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ENGINEERING YODER MANUFACTURING ROTARY SLITTING LINES

moves a great variety of imperfect items. This equipment can detect imperfections that create as small as 3-pct variation in light reflected or transmitted from the items being inspected. It is usable with conveyor belts up to 10 ft wide and at speeds up to 600 fpm. (Atronic Products Inc.)

For more data circle No. 80 on postcard, p. 157

Sheet-Lifter Weighs

With a built-in scale, a sheet lifter weighs each load lifted. The weight is automatically indicated on a large, easy-to-read dial convenient to the operator's position. This attachment can pay for itself in one inventory period or in detecting "short" bundles at the receiving dock. It eliminates the costly nonproductive round trip to the fixed platform scale. (Martin-Decker Corp.)

For more data circle No. 81 on postcard, p. 157

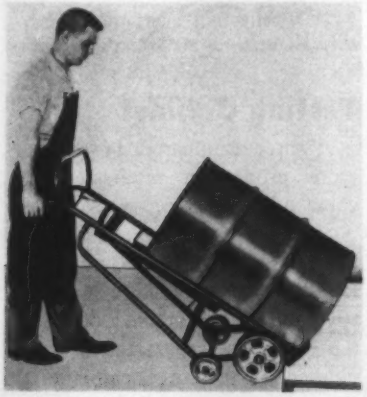
Alloy Resists Heat

For service in temperatures ranging up to and including 2300°F, an alloy has good foundry and weldability characteristics. Prime immediate applications are: heat-treat furnace parts for the steel and automotive industries, tubes for the chemical industry, cement kiln parts, smelting furnace and calcining furnace parts. (American Brake Shoe Co.)

For more data circle No. 82 on postcard, p. 157

Places Heavy Drums

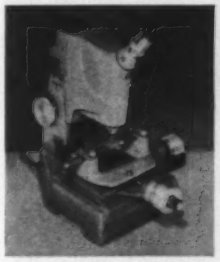
A drum and barrel truck makes it possible for one operator to easily



place heavy drums on pallets. The design of this truck allows the barrel to be carried at pallet height, so

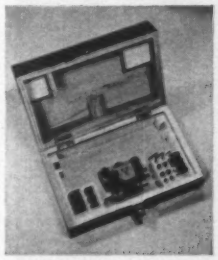
PRECISION PRODUCTION PROBLEMS?

Here's help from Bausch & Lomb in TOOL DESIGN INSPECTION FABRICATION MEASURING TESTING



TOOLMAKERS' MEASURING MICROSCOPE

Quickly measures transparent or opaque objects of any contour. Linear, accurate to 0.0001"; angular, to 1 minute of arc.

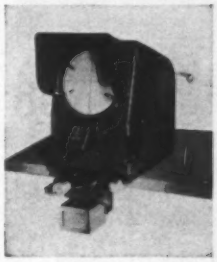


NEW UNIVERSAL STAGING FIXTURE

Positions small parts for critical measurement with B&L Bench Comparator and Toolmakers' Microscope. Auxiliary base, with 7" travel, increases range beyond that of measuring stage.

STEREOZOOM* MICROSCOPES

Magnified 3-D views of tiny parts. Dustproof, shockproof, can be mounted right in machine or fixture. Speeds assembly, inspection. Most complete line, widest field of view.

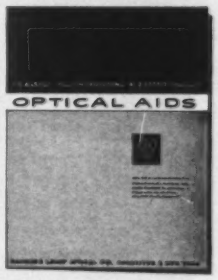


BENCH COMPARATOR

Exclusive understage illumination—no complex set-ups, no holding fixtures for most work. Magnified silhouettes, show errors instantly. Reads to 0.0001" with optional micrometer stage.

OPTICAL AIDS CATALOG

Time-and-money-saving data on Surface Comparators, Industrial Magnifiers, Macroscopes, Micrometer Discs, Brinell Microscopes, Microscope Bodies, Wide Field Tubes, Shop Microscopes.



NEW SCRATCH-DEPTH GAGE

With this simple hand-held instrument you can measure the depth of any scratch to 0.0001", with a range of 0" to 0.015"

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Please send literature on optical production aids checked below:
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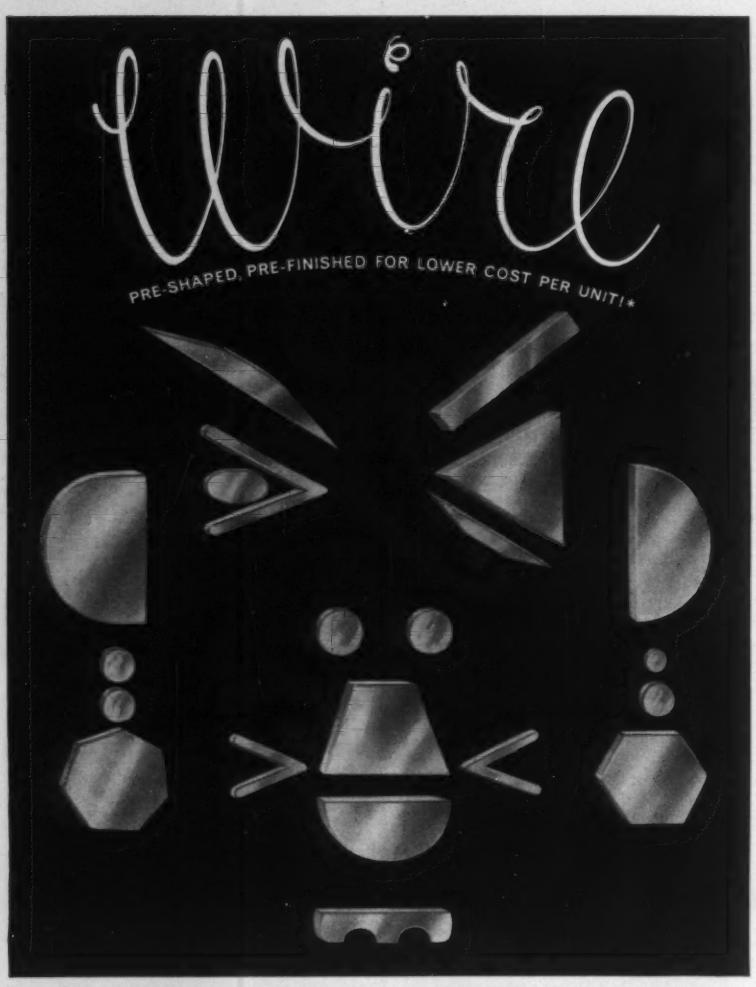


*Examples shown are greatly enlarged cross-sectional views of selected standard and special shapes available

The right shape plus the right finish equals lower production costs

with CONTINENTAL® round and special shaped wire

Face up to the pleasant fact that you can often shave your production costs appreciably—and win extra sales—by choosing the right shape in wire. You save because you eliminate forging, stamping, rolling or machining operations. What's more, you can get these ready-made shapes (and many others than shown) in bright, galvanized, coppered, liquored, or tinned finishes that save further in polishing and plating. If you use low and medium low carbon steel wire in any shape, form or finish, by all means learn what Continental can offer you. We have solved literally thousands of problems involving wire. We'd love to have a shot at solving yours.

Write for free copy of our new wire manual

CONTINENTAL STEEL
CORPORATION KOKOMO, INDIANA

PRODUCERS OF: Manufacturer's Wire in many sizes, tempers, and finishes, including Galvanized, KOKOTE, Flame Sealed, Coppered, Tinned, Annealed, Liquor-Finished, Bright and special shaped wire. Also Welded Wire Reinforcing and Galvanized Fabric, Nails, Continental Chain Link Fence, and other products.

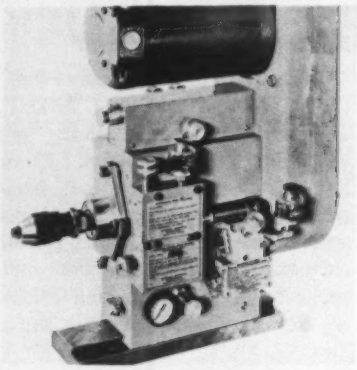
NEW EQUIPMENT

that in one forward motion the drum can be placed on a pallet with a minimum of operator effort. Drums also can be safely lowered from pallets with this cart. The truck is available with two-wheel safety brakes which give the operator complete control of the load when moving drums down ramps or steep inclines. (Valley Craft Products, Inc.)

For more data circle No. 83 on postcard, p. 157

Increases Productivity

For drilling, tapping, threading, nut tapping, reaming and other basic secondary operations, a single-spindle automatic unit mounts at any angle or in any position desired. It has speeds ranging from 500 to 10,000 rpm. The completely self-



contained unit has a maximum spindle stroke of 2½ in. and is adjustable down to ⅛ in. It has a capacity of 0.020-⅜ in. drilling and/or up to ⅜ in. tapping in mild steel. (Universal Automatic Corp.)

For more data circle No. 84 on postcard, p. 157

Testing Cabinet

A three-chambered, low-temperature production processing machine offers increased versatility in production processing and research testing. The machine provides three separate low-temperature liquid refrigerating baths at the same time; the baths operate at the same or different constant temperatures. Over-all machine dimensions are 141-in. long x 37-in. high x 54-in. wide. The top of the frame is cov-

ered with 16-gage stainless steel, so as to serve as a laboratory table. All electrical facilities are explosion proof for maximum safety. (Cincinnati Sub Zero Products)

For more data circle No. 85 on postcard, p. 157

Indicator Crayons

Temperature-indicating crayons and paints can be used in any industrial or commercial application where temperature, and its correct determination, are factors. These easy-to-use temperature-measuring devices accurately indicate the temperature of any hot surface by distinct changes in color. The changes are not slight alterations in the shade of the original color, but an easily discernable change to a different color. (Air Reduction Sales Co.)

For more data circle No. 86 on postcard, p. 157

Shears

Hand-operated, a series of shears shear corrugated roofing and other corrugated steel or aluminum sections. It completely eliminates the need for stocking different lengths. No mounting is required. Cuts are clean and burr free, made quietly, without distortion at either end of cut. There are no sharp edges, and there is no loss of material. The shear can be operated by one man on the floor of the shop or on the ground at the job site. (W. A. Whitney Mfg. Co.)

For more data circle No. 87 on postcard, p. 157

Strip Seam Welder

Used in steel-mill processing lines, a utility strip seam welder welds clean or galvanized metal up to 48-in. wide; from 16-30 gage thick at a speed of 30 fpm on clean stock. Welding power is provided by a 150 kva transformer. Weld strength of 100 pct of annealed parent metal is achieved by an end-lap weld. Lap is adjustable up to ⅜ in. In operation, the welder centers the pre-sheared strip edges, gages the overlap, clamps leading and trailing edges and welds. (National Electric Welding Machines Co.)

For more data circle No. 88 on postcard, p. 157

Special set-up cuts work handling

Combining ingenuity and standard tooling provides a work saving set-up for "big" drilling jobs at Electric Box and Switchboard Company, Chicago. Formerly, 150 to 200 holes in 40 X 72" ebony asbestos and steel switchboard panels were drilled with a conventional drill press, then the work was moved to another location for additional drilling. Now the entire job is completed by one standard Delta Overhead Drill Press. By suspending the drill press from a track 40" long and putting casters on the work table, extra handling and positioning are reduced and special jigs and fixtures eliminated. Set-up permits drilling at any point on a circle 23¾" in diameter.

This is typical of how rugged, versatile Delta Industrial Tools are used throughout industry to supplement or replace costly single purpose machines. For free illustrated booklet of valuable cost-cutting ideas, write: Rockwell Manufacturing Company, Delta Power Tool Division, 640G N. Lexington Ave., Pittsburgh 8, Pa. In Canada: Rockwell Manufacturing Company of Canada, Ltd., Box 420, Guelph, Ontario.

Now . . . Look to Lukens For Steel Shape Savings

Face up to the true cost of inventories

$253.50 ***in interest alone.*** That's what it would have cost our customer to stock the steel for his order of these 5-16" gage tube sheets—had he decided to blank and punch these shapes in his own plant. His plate stock cost would have been $25,350. The interest cost of carrying this for 90 days at—say 4%—is $253.50.

Fortunately, the customer took advantage of Lukens Steel Plate Shapes Service and avoided tying up his capital in plate inventory. *Plus:* he paid no freight charge on the 50% scrap involved . . . instead he was given an allowance for the scrap at high steel mill prices. He avoided the expense of scrap handling. He eliminated the problem of shop spoilage.

Moral: Don't tie up capital in steel plate inventories. Contact Lukens for Steel Plate Shapes Service . . . flame cutting, shearing, blanking, pressing, bending, welding—of carbon and alloy plate produced on our own rolling mills. Call or write Fabrication Building, Lukens Steel Company, Coatesville, Pennsylvania. Address Dept. A-70.

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Fabrication Building, Dept. A-70.
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Please send me your free booklet on Steel Plate Shapes.

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Company_____ Title_____

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LUKENS ®

The Iron Age Summary

Slump Is More Than Seasonal

Basic factors are behind the drop in steel orders. It's more than seasonal factors and inventory control.

But users are getting worried about inventories. International unrest may stimulate buying.

■ Causes of the current steel slump are deeper than seasonal factors and inventory correction.

Basic factors behind the low rate of production will keep steel operations at a low rate through the summer and into autumn.

Outlook Not Encouraging — Inventory control and the summer letdown are not to be discounted in the market decline. But they have been lengthened and extended by low rate of business among major steel consumers.

And except for the annual pickup of steel buying for the new auto models, the outlook for big steel users is far from encouraging.

Small Car Impact—To compound recent delays in automotive steel orders, steelmen are now concerned over the impact of the small cars on steel tonnage. The four small cars introduced during the 1960 model year may have resulted in better sales by stimulating the market.

But with four more small cars coming in 1961, the 800 lb loss of steel in a compact compared with a conventional car will have an impact on overall steel comsumption by the auto industry.

As the market continues to bump along at a low rate of orders (probably not strong enough to sustain a 50 pct operating rate) there are some indications of a firmer tone.

Some Hope—For one thing, steel users with low inventories are trying to line up mill commitments without actually placing orders. Apparently low inventory is the company policy, but purchasers are trying to safeguard their mill position without actually placing orders.

Secondly, the turn of events in Cuba, Africa, and elsewhere in world politics can result in stepped up orders. With the world situation uncertain, many users may feel more comfortable with bigger stocks of steel.

Product Strength — Among the products, galvanized and tinplate remain strong, although not up to what they were two months ago. In the Midwest particularly, heavy structurals are holding up better than most products, because of heavy highway construction in that area.

In the face of user pressure the industry's pricing system is standing up in what is turning out to be the toughest test since World War II.

Base Prices Hold—There is no weakening of prices for standard mill products. Base prices are firm and there is no significant waiving of extras.

However, the slump has pretty well swept away price reforms at the warehouse level and at the mill-to-warehouse level. Allowances to distributors of many products have been restored to a great extent.

In the carbon steel warehouse field, warehouses have put through base price reductions on standard items and the quantity charge system has been modified to reduce prices of small orders.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,556	1,476	1,739	365
Ingot Index				
(1947-1949=100)	96.9	91.9	108.3	22.7
Operating Rates				
North East Coast	59.0	57.0*	69.0	15.0†
Buffalo	55.0	52.0*	61.0	0.0†
Pittsburgh	48.0	44.0*	59.0	22.0†
Youngstown	46.0	35.0*	46.0	10.0†
Cleveland	47.0	46.0	64.0	0.0†
Detroit	85.0	82.0*	80.0	23.0†
Chicago	58.0	58.0*	63.0	5.0†
Cincinnati	45.0	43.0*	54.0	78.0†
St. Louis	50.0	52.0	68.0	79.0†
South	65.0	65.0*	63.0	11.0†
West	57.0	55.0*	63.0	0.0†
U. S. Rate	54.6	51.8	61.0	12.9

*Revised †IRON AGE Estimate

Source: American Iron And Steel Institute

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$31.50	$31.17	$31.00	$39.50
No. 2 bundles	$21.17	$21.17	$20.83	$27.00
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	26.80
Copper, electrolytic	33.00	33.00	33.00	30.00
Lead, St. Louis	11.80	11.80	11.80	11.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	103.50	102.425	101.50	102.50
Zinc, E. St. Louis	13.00	13.00	13.00	11.00

Tool and Die Sales May Drop

Sales are now about 25 pct over 1959 levels, but may drop 10 pct this fall.

Detroit tool and diemakers say buyers will find attractive pricing in the market.

■ Tool and die business in the opening part of 1960 has been active. Employment is higher than a year ago. Workers are putting in more hours. Sales and orders are up. So is the backlog of unfilled orders.

But the trade is sensing a toning down of activity in coming months. An April survey by the National Tool & Die Manufacturers Assn. showed member tool and die shop owners were slightly less optimistic about the future outlook than they were in the first quarter of 1960. Some 47 pct looked for "good" business the rest of the year, 38 pct appraised the future as "fair," 11 pct "excellent" and 4 pct "poor." A month earlier the excellent-good category was 9 pct higher, fair-poor 9 pct lower.

Prop Expected—Through April, according to G. S. Eaton, executive vice president of the NTDMA, the value of shipments by the industry in 1960 was 25 pct above a year ago. He estimates, however, the figure will decline to perhaps 15 pct by the end of the year.

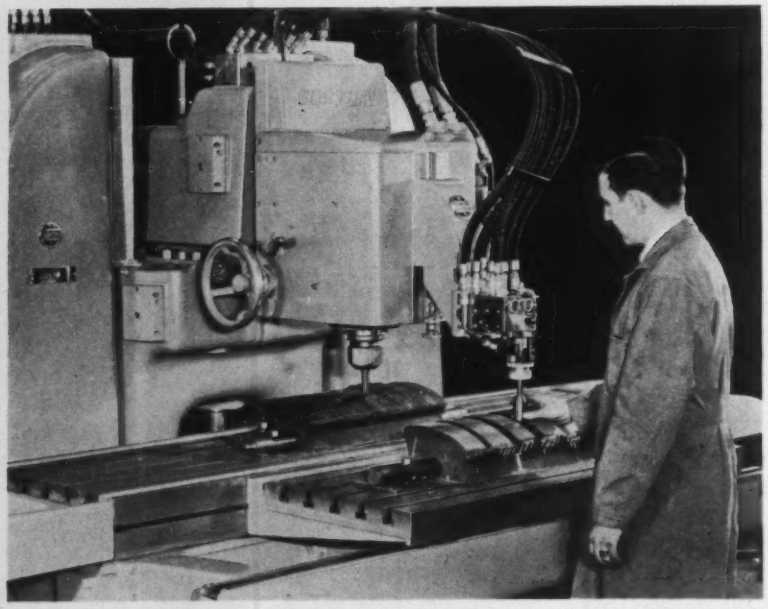
Purchasing agents who have been wondering if an increase in steel prices this year would mean rising tool and die prices probably don't have to worry too much, according to Mr. Eaton. He estimates materials account for 10 to 25 pct of the cost of standard tools and dies depending on type, size and weight. The rest is labor and overhead.

Attractive Pricing — In Detroit, tool and die shops may be in a position to offer attractive prices in the last half of the year. C. A. Cahn, managing director of the Automotive Tool & Die Manufacturers Assn., says his association won't be "unduly burdened" in coming months.

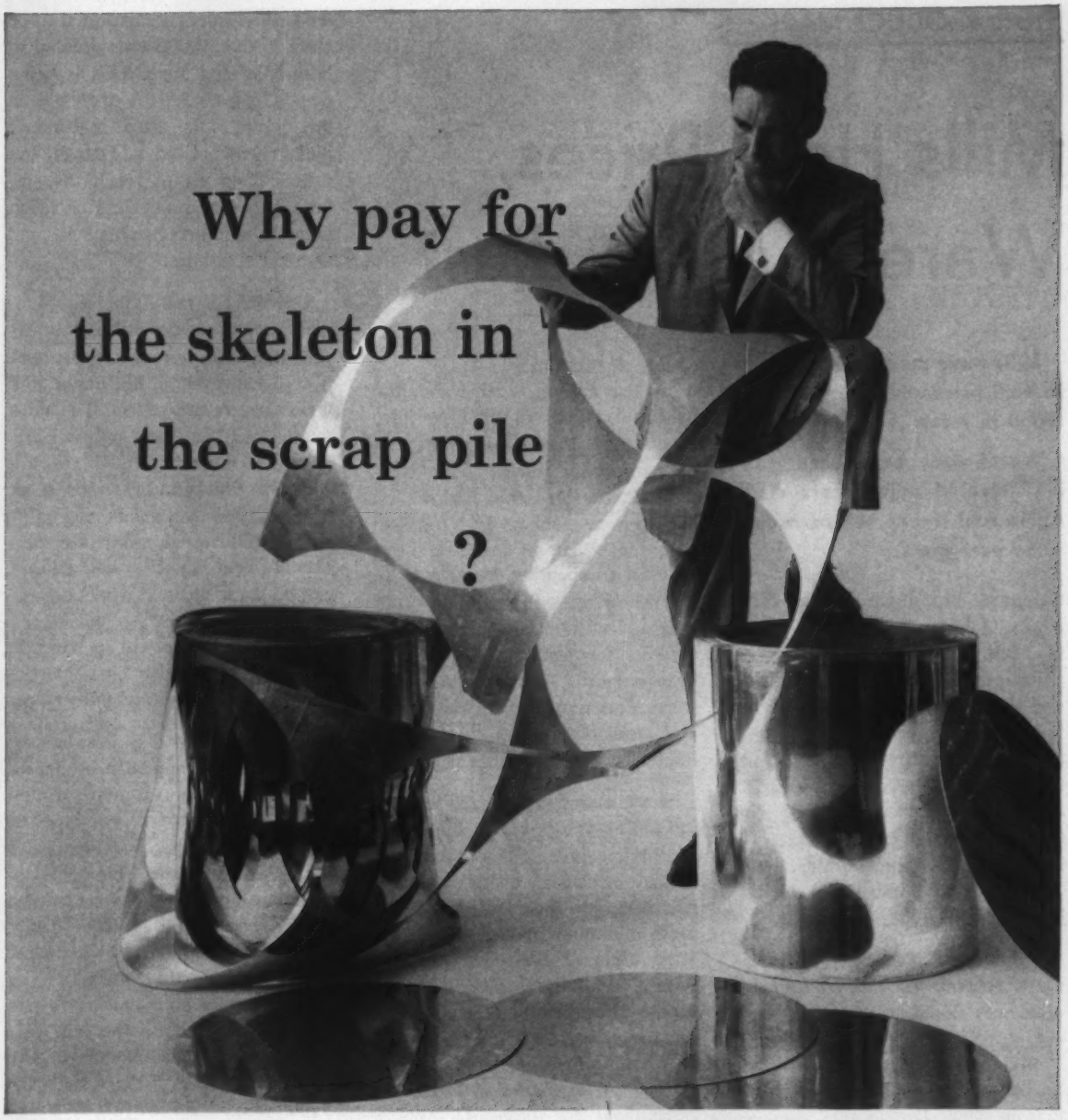
"For the latter half of this year," says Mr. Cahn, "our shops will have greater than normal available capacity. This will be true also of such related services and products as engineering, design, heat treating, castings, patterns, composite sections and the like." He emphasizes that customers coming into the Detroit market this summer will benefit by unusually fast delivery and advantageous pricing.

Better Service—Aside from pricing, a recent move by Pratt & Whitney Co., Inc., in selling cutting tools and conventional gages should be of interest to purchasing agents. Such equipment had been sold directly to purchasing agents by the company, but now is sold through local industrial distributors. The aim is better service to customers of standard items.

Perhaps making things brighter for die makers this year is a report that die casting production may reach a record high in 1960. The American Die Casting Institute says so, but adds that the record hinges on an absence of supply and price problems in zinc and aluminum. The main user of die castings is the auto industry. But many new die casting markets outside the auto business are rising up.



JUST OUT: This is the new George Gorton Machine Co. "Bedmil." Designed for the aircraft and missile industries, it can be used in plastic mold shops, and those making coining, drop forging and diecasting dies. The machine comes in 14 models and 34 combinations.



WHEN you stamp your own aluminum circles or any irregular blanks, up to 25% of coil weight ends up as scrap.

You can eliminate this waste—plus labor of shearing and blanking—by buying circles or blanks direct from Fairmont.

Fairmont is *the* source for circles. As a prime supplier of aluminum blanks to *every* utensil maker, Fairmont's 30-year stockpile of dies is unduplicated anywhere. Find out how easily we can fill your requirements from our stock of dies.

Or by blanking from your dies in our plant, we can effect labor, material savings for you.

Other Fairmont benefits: the consistent quality that is a Fairmont tradition . . . individual flash annealing for finer grain structure . . . 100% inspection of every blank.

FIND OUT ABOUT FAIRMONT'S CUSTOM BLANKING SERVICE NOW

A Fairmont engineer will be glad to give you details. Call your local Fairmont office. Or write Vice President, Sales, Dept. 33G Fairmont Aluminum, Fairmont, West Virginia.

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Mills Hold Prices, Warehouses Adjust

Mills have managed generally to hold prices despite the sharp slump in sales.

Warehouses have been making selected adjustments since April. And it has helped regain some customers.

■ Despite the slump in steel buying, mill prices are generally holding. But there have been areas of adjustment at the warehouse level and in mill-to-warehouse sales.

In recent years mills have trimmed allowances to distributors for tubular products, merchant wire and other products. Mills said jobbers gave away discounts. This took business away from the mills.

Now, most jobber allowances have been restored.

Allowances Restored—In April the warehouse discount on stainless plate was raised to 10 pct from 5 pct.

Mills began installing jobber allowances on merchant wire products in May. Distributors now get a 4 pct discount on both direct shipments and shipments into stock. In effect, this restores dual pricing for distributors and dealers.

This month jobber discounts on standard pipe and miscellaneous linepipe were increased to 5 pct. Mills had eliminated or reduced jobber discounts on these products in 1958.

Hit by Imports—With the exception of stainless plate, these moves center on products hit heavily by imports. Distributor agitation may also have helped restore discounts at this time.

In the carbon steel warehouse field, two types of changes have been made. Warehouses have cut base prices for some popular standard items. For some bar shapes, cuts were as much as $8 a ton. But here, too, the items are those meeting stiff competition from imports.

The other change involved changes of item quantity charges. Charges for small quantities have been reduced. This has resulted in some users returning to warehouses as customers. And warehouses also hope it will help stabilize prices.

Sheet and Strip—Regardless of the disappointment over the lag in automotive orders, automakers are at least ordering. There's a lot of heel-dragging, and orders are almost minimum in size. But other large users of flat-rolled products have almost disappeared from the market. **East Coast** mills are sitting out vacation shutdowns by users—and hoping for an improvement in August. A large user in **Pittsburgh** overbought for July and August, will slash September orders to compensate for it. Export tonnage has helped hold production up in **Cleveland.** July orders are expected to be close to the 30,000 tons ordered in both May and June. This is being helped by a 10,000 ton order placed last week. The usual mid-month pickup was noticed in **Detroit,** but orders have yet to reach the size necessary for automakers to reach their ambitious September and October schedules.

Galvanized and Tinplate—Tinplate shipments are still below expectations and mill stocks are heavy. However, a **Pittsburgh** mill insists orders are strong. The third quarter will be down only slightly from the second. Orders are still good in **Chicago,** but mills don't foresee 1960 shipments exceeding 1959. Galvanized mills are also running near capacity, but delivery can be made in three weeks or less. Several automakers are placing fair orders for galvanized in **Detroit.** It's used extensively in compact cars for the underbody and support members.

Wire—Merchant wire producers in **Pittsburgh** report a mild seasonal upturn. But imports continue to hurt. Over the first five months of the year, domestic shipments of merchant products were down nearly 100,000 tons from 1959. Imports were up about 11 pct. New discounts offered distributors by merchant wire mills haven't helped sales. A producer points out that the 4 pct discount amounts to 40¢ on a keg of nails. Foreign nails are being offered for $2 to $3 under the domestic price. Northern producers haven't followed the lead of Atlantic Steel Co., **Atlanta,** which reduced its net prices for nails by $1.50 a keg.

Stainless—The market continues slow. There are reports along the **East Coast** that local sources are encountering competition from warehouses in the **Midwest.** Mills are scrambling for orders—regardless of size. There's no sign of a break in prices at the mill level, but warehouses are undercutting each other.

PURCHASING AGENT'S CHECKLIST

Prices on some aluminum products may go up soon despite stiff competition and excess capacity. P. 98

Inventories of unsold 1960 cars create a problem. P. 107

Programmed drive and control systems integrate operations of steel rolling mill. P. 142

COMPARISON OF PRICES

(Effective July 19, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	July 19 1960	July 12 1960	June 21 1960	July 21 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	July 19 1960	July 12 1960	June 21 1960	July 21 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.57
Foundry, South Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	11.00	11.00	11.00	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$30.50	$30.50	$30.50	$43.50
No. 1 steel, Phila. area	33.50	33.50	33.50	39.50
No. 1 steel, Chicago	30.50*	29.50	29.00	35.50
No. 1 bundles, Detroit	27.50	27.50	27.50	37.50
Low phos., Youngstown	34.50*	33.50	34.50	44.50
No. 1 mach'y cast, Pittsburgh	48.50	48.50	49.50	51.50
No. 1 mach'y cast, Phila.	49.50	49.50	51.50	49.50
No. 1 mach'y cast, Chicago	45.50	45.50	45.50	59.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$31.50*	$31.17	$31.00	$39.50
No. 2 bundles	21.17	21.17	20.83	27.00
Coke, Connelsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.50-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	$33.00	$33.00	$33.00	$30.00
Copper, Lake, Conn.	33.00	33.00	33.00	30.00
Tin, Straits, N. Y.	103.50	102.625	101.50	102.50
Zinc, East St. Louis	13.00	13.00	13.00	11.00
Lead, St. Louis	11.80	11.80	11.80	11.80
Aluminum, virgin ingot	28.10	28.10	28.10	26.80
Nickle, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Upswing Noted In Some Locations

Many areas report another week of stationary prices and little action.

Some key cities, however, claim there is a bright side to the picture.

■ The market can only go one way now—up—and the trend may have started.

A large number of reporting areas complained, once again, that there was no improvement this week and prices were remaining stable. Several others, however, noted a slight, but definite, upswing.

For example, small purchases at the mill level forced the Chicago market up this week. The movement started in the railroad grades and spread to include some electric furnace and steelmaking grades.

A slight price increase in No. 1 dealer bundles in Cleveland tended to force that market up slightly. Definite signs of strength are being shown in St. Louis. A better tone to the market has also been reported from Birmingham where foundries are beginning to place August orders.

In other locations it is still a matter of exports maintaining the market with no significant drops reported. There is some scattered speculation that August may not match up to July for exports, but this has not caused any real pessimism.

Pittsburgh — Prices of most grades are unchanged as the market lull continues. Consumers show little interest in buying. On the other hand, little scrap is being offered for less money or even at the current levels. One mill is paying $25 for small quantities of no. 2 bundles. The price of this grade has not changed for weeks, despite the lack of activity. Another mill has scheduled shipment of about 1000 tons due on an old order.

Chicago — Small purchases at mill level plus growing dealer resistance forced the Chicago market up this week. The movement began in railroad grades, where some sales made as late as Wednesday were being filled at cost or higher by Thursday. The movement spread to include some electric furnace and steelmaking grades by the beginning of this week.

Philadelphia — Dealers have reached a "it has to break soon" attitude. Export business is still maintaining this market, but several dealers feel August exports will drop considerably after a better-than-normal July. Actually the situation is "no worse than it has been" but there have been some reports that the cast market is a bit softer. Domestic business still remains at a virtual standstill.

New York—A good export demand is still holding prices up here. Industrial scrap intake is seasonally off, according to dealers. But there is not likely to be a boost in prices. Foreign buyers have clearly indicated they are ready to wait out any attempts by dealers to raise prices.

Detroit — Dealers are calling brokers now, nobody's calling them. But it doesn't do much good. The only movement of scrap is to Canada at current prices. Tonnages are small. Local mills are loaded with inventory.

Cleveland—The Valley market is up $2 on a small sale of No. 1 dealer bundles. A Valley mill tried to buy for quoted levels of $32 for several weeks unsuccessfully. Another mill bought small tonnage for $34 but nobody is reaching for it. The price increase does not herald any increased demand but more dealers are refusing to sell out.

St. Louis—Supplies of scrap are dwindling in this area and definite signs of strength are being shown. No. 2 heavy melting and foundry steel each advanced $1. Buying has picked up somewhat and purchases are becoming harder to acquire.

Cincinnati—The outlook here is for largely unchanged prices next month on continued small tonnage requirements. Mills are not anxious to buy and dealers are not anxious to sell at the present prices. Therefore the market continues to dawdle.

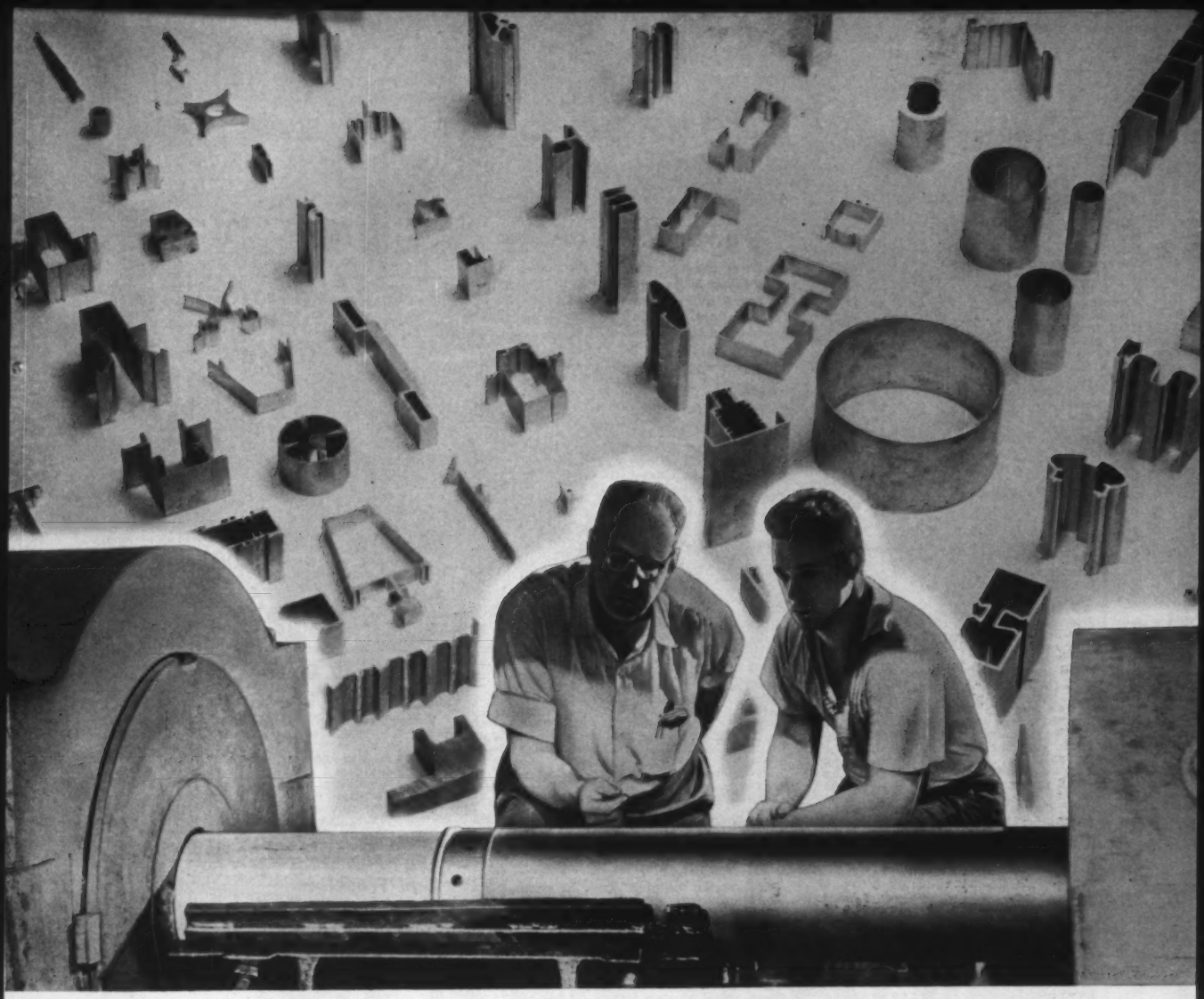
Birmingham—With the exception of openhearth scrap, there seems to be a better tone to the market here. Foundries are beginning to place August orders, apparently feeling prices have about reached bottom and desiring to fill inventories before there is an upturn.

Buffalo—Inactivity continues in the market here with no price changes. Dealers are shipping against old orders and expect no activity until the first of the month.

Boston — For the first time in three months, there is an undertone of a stronger market. Domestic activity is still at a low point, but the export market is stronger.

West Coast—The market here is remaining stationary. The mills simply are not buying and scrap intake is slow. The only activity keeping the market alive is exporting.

Houston — The market is quiet and brokers report that little scrap is moving. There is still a little export, but exporting brokers say the outlook is dim until September.



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SCRAP PRICES

(Effective July 19, 1960)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	31.00 to 32.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	17.00 to 18.00
Low phos. punch'gs plate	37.00 to 38.00
Heavy turnings	27.00 to 28.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	50.00 to 51.00
RR specialties	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	39.00 to 40.00
Stainless	
18-8 bundles and solids	190.00 to 195.00
18-8 turnings	90.00 to 95.00
430 bundles and solids	95.00 to 100.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	30.00 to 31.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. forge crops	41.00 to 42.00
Low phos. punch'gs plate, ¼ in. and heavier	35.00 to 36.00
Low phos. 2 ft. and under	33.00 to 34.00
No. 1 RR hvy. melting	33.00 to 35.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	51.00 to 52.00
Rails 2 ft. and under	47.00 to 48.00
Angles and splice bars	42.00 to 43.00
RR steel car axles	48.00 to 50.00
RR couplers and knuckles	39.00 to 40.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	40.00 to 41.00
Cast iron wheels	31.00 to 32.00
Malleable	44.00 to 45.00
Stove plate	34.00 to 35.00
Steel car wheels	37.00 to 38.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	85.00 to 90.00
430 turnings	40.00 to 50.00

Philadelphia Area

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings	23.00 to 24.00
Low phos. 5 ft and under	37.00 to 38.00
Low phos. 2 ft punch'gs	39.00 to 40.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	27.00 to 28.00
RR specialties	39.00 to 40.00
Rails, 18 in. and under	53.00 to 54.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00
Cast iron car wheels	40.00 to 41.00
Malleable	45.00 to 46.00
No. 1 machinery cast	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.50 to $27.50
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	26.50 to 27.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Low phos. 18 in. and under	33.00 to 34.00
Rails, random length	43.00 to 44.00
Rails, 18 in. and under	50.00 to 51.00
No. 1 cupola cast.	35.00 to 36.00
Hvy. breakable cast.	32.00 to 33.00
Drop broken cast.	47.00 to 48.00

Youngstown

No. 1 hvy. melting	$33.00 to 34.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	19.00 to 20.00
Low phos. plate	34.00 to 35.00

Cleveland

No. 1 hvy. melting	$29.50 to $30.50
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	29.50 to 30.50
No. 1 factory bundles	33.00 to 34.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	29.50 to 30.50
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft. & under	37.00 to 38.00
Drop forge flashings	29.50 to 30.50
Low phos. punch'gs plate	30.50 to 31.50
Foundry steel, 2 ft. & under	33.00 to 34.00
No. 1 RR hvy. melting	34.00 to 35.00
Rails 2 ft. and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	47.00 to 48.00
No. 1 machinery cast.	50.00 to 51.00
Stove plate	39.00 to 40.00
Malleable	45.00 to 46.00
Stainless	
18-8 bundles	180.00 to 185.00
18-8 turnings	75.00 to 80.00
430 bundles	80.00 to 85.00

Buffalo

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 busheling	29.00 to 30.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Low phos. plate	36.00 to 37.00
Structurals and plate, 2 ft and under	39.00 to 40.00
Scrap rails, random lgth.	37.00 to 38.00
Rails 2 ft and under	47.00 to 48.00
No. 1 machinery cast.	46.00 to 47.00
No. 1 cupola cast.	42.00 to 43.00

St. Louis

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
Foundry steel, 2 ft.	31.00 to 32.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	18.00 to 19.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	18.00 to 19.00
No. 1 RR hvy. melting	31.50 to 32.50
Rails, random lengths	38.00 to 39.00
Rails, 18 in. and under	41.00 to 42.00
RR specialties	38.00 to 39.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	34.00 to 35.00
Stove plate	35.50 to 36.50
Cast iron car wheels	35.00 to 36.00
Rerolling rails	47.00 to 48.00
Unstripped motor blocks	36.00 to 37.00

Birmingham

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	8.00 to 9.00
Electric furnace bundles	32.00 to 33.00
Elec. furnace, 3 ft & under	32.00 to 33.00
Bar crops and plate	36.00 to 37.00
Structural and plate, 2 ft.	35.00 to 36.00
No. 1 RR hvy. melting	28.00 to 29.00
Scrap rails, random lgth.	39.00 to 40.00
Rails, 18 in. and under	45.00 to 46.00
Angles and splice bars	37.00 to 38.00
No. 1 cupola cast.	46.00 to 47.00
Stove plate	46.00 to 47.00
Cast iron car wheels	37.00 to 38.00
Unstripped motor blocks	35.00 to 36.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	16.00 to 17.00
Machine shop turnings	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	165.00 to 170.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 dealer bundles	27.00 to 28.00
No. 2 bundles	15.00 to 16.00
No. 1 busheling	24.00 to 25.00
Drop forge flashings	24.00 to 25.00
Machine shop turn.	8.00 to 9.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	11.00 to 12.00
Cast iron borings	11.00 to 12.00
Heavy breakable cast.	29.00 to 30.00
Mixed cupola cast.	33.00 to 34.00
Automotive cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	60.00 to 65.00
430 bundles and solids	60.00 to 65.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $24.50
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	24.00 to 24.50
No. 2 bundles	14.00 to 15.00
No. 1 busheling	24.00 to 24.50
Machine shop turn.	5.00 to 6.00
Shoveling turnings	7.50 to 8.50
Clean cast. chem. borings	12.00 to 13.00
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	32.00 to 33.00
Heavy breakable cast.	26.50 to 27.50

San Francisco

No. 1 hvy. melting	....	$34.00
No. 2 hvy. melting	....	30.00
No. 1 dealer bundles	....	30.00
No. 2 bundles	....	20.00
Machine shop turn.	$14.00 to	15.00
Cast iron borings	14.00 to	15.00
No. 1 cupola cast.	....	46.00

Los Angeles

No. 1 hvy. melting	....	$32.00
No. 2 hvy. melting	....	29.00
No. 1 dealer bundles	....	27.00
No. 2 bundles	....	17.00
Machine shop turn.	....	13.00
Shoveling turnings	....	15.00
Cast iron borings	$15.00 to	16.00
Elec. furnace 1 ft and under (foundry)	42.00 to	43.00
No. 1 cupola cast.	42.00 to	43.00

Seattle

No. 1 hvy. melting	....	$35.00
No. 2 hvy. melting	....	33.00
No. 2 bundles	....	22.00
No. 1 cupola cast.	....	36.00
Mixed yard cast.	....	36.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	....	$25.80
No. 2 hvy. melting cut 3 ft. and under	....	22.50
No. 1 dealer bundles	....	25.80
No. 2 bundles	....	19.00
Mixed steel scrap	....	16.00
Bush., new fact., prep'd	....	25.50
Bush., New fact., unprep'd	....	20.45
Machine shop turn.	....	12.00
Short steel turn.	....	12.00
Mixed bor. and turn.	....	12.00
Cast scrap	....	33.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	....	$32.00
No. 2 hvy. melting	....	29.00
No. 2 bundles	....	18.00
Machine shop turn.	....	12.00
Shoveling turnings	....	14.00
Cut structural plate 2 ft & under	$40.00 to	41.00
Unstripped motor blocks	26.00 to	27.00
Cupola cast.	32.00 to	33.00
Heavy breakable cast.	25.00 to	26.00

S-E-G-R-E-G-A-T-E-D SCRAP IS WORTH MORE

Rub specimen with file to obtain clean surface. Add 1 drop of 1.1 nitric acid. If there is a definite attack, submit sample to spark test. A typical short chromium spark will separate the sample from non-stainless metals. Heat specimen to 1850 deg. F. and oil quench. Test for hardness. A Rockwell C hardness in the range of 48/55 will indicate the carbon content typical of stainless steel type 420. It is well to have a known sample for comparison.

Here is how to test for

STAINLESS STEEL TYPE 420

Type 420 is the famous cutlery grade of stainless steel. With its excellent corrosion resistance, toughness and ability to withstand abrasion, it has become an important member of the stainless steel family. In addition to its use for cutlery, this type is excellent for surgical instruments, high spring temper applications, bushings, bearings, valves and other wear-resisting parts where extra hardness is required.

For scrap of known analysis, our personnel, equipment and strategically located facilities are specifically geared for the purchase or sale of dependably segregated metals. We welcome your inquiry.

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FOREIGN TRADE — LURIA INTERNATIONAL, INC., CHRYSLER BUILDING EAST, NEW YORK, N. Y. • 5950 S. BOYLE AVE., LOS ANGELES 58, CAL. • *Cable Address:* FORENTRACO

Will Congo Unrest Affect Copper?

Despite political upheavals in Africa, most U. S. copper producers don't expect a serious supply shortage.

Consumers are already well stocked. And U. S. and Chilean mines can take up the slack if African mines shut down.

■ How will the political unrest in the Congo affect copper supplies?

U. S. copper trade sources agree the exact balance of suply-demand may be in doubt. But the consensus is that there will be either too much copper or just enough copper depending on what the Africans do.

Hedging Likely — One industry spokesman says there is easily enough capacity in Chile and the U. S. to take up the slack even if African mines stay shut through the rest of the year.

But he acknowledges that this might prompt some substantial hedging by European buyers which could put pressure on the price, if not the actual supply.

Users Stocked Up — Si Wakesberg, secretary of the National Association of Secondary Material Industries, points out that the "loss of Congo metal (copper) does not have the same tremendous impact it might have had six months ago." Why? Consumers "are stocked up pretty well."

The Copper Div., Business and Defense Services Administration, U. S. Dept. of Commerce, in its mid-year outlook, comments on the situation this way: "The supply-demand picture for refined copper for the balance of the year will be uncertain until there is a clearer indication of supply developments in the African Copper belt."

Domestic Outlook—For the domestic copper market the report forecasts an overall five pct drop in shipments of brass mill, wire mill, and copper-base foundry products in 1960 from 1959.

However, they expect demand for copper-base powders to be up from 10 to 15 pct.

The report points out that a lot of "ifs" in the picture could change the outlook.

For instance, "The adverse trend in sales of mill and foundry products may be altered by the expected increase in business from rising investment in capital equipment, increased activity in the automotive industry, and inventory replenishment by those who have gone through several months of cautious buying—anticipating a drop in copper prices."

Exports Strong—Exports of copper scrap are booming, says the Commerce Dept. The quarterly average for 1958 and the first half of 1959 was 12,000 tons. This fell sharply in the last half of 1959 because domestic demand zoomed, prompted by the longest series of strikes in the U. S. copper industry's history.

But the rate of copper scrap export in 1960 is 29,500 tons average per quarter. And by the end of April 1960 more scrap had been exported than in the entire year of 1959.

Refinery Stocks Up—The latest statistics from the Copper Institute, for June, show that both in and outside the U. S., deliveries to fabricators were down, while unsold stocks at the refineries were up.

In the U. S., the 106,207 tons delivered in June was down from the 108,266 tons in May, and was the lowest since January.

Aluminum

Aluminium Ltd., the large Canadian producer, is expanding its holdings at opposite ends of the world.

The company is investing $2.75 million in the installation of a new rolling mill next to the existing plant in Ghana, Africa. Production is expected to begin early in 1962.

In Australia, Aluminium will spend $4 million to add 4500 long tons annual capacity to its rolling mills and 1700 long tons to extrusion presses.

This project is being brought in about two years ahead of the original schedule. When it is completed in 1963 Australian Aluminium Co., Ltd., will have an annual capacity of 20,000 long tons of rolled products and 9000 long tons of extrusions.

Tin prices for the week: July 13—102.875; July 14—102.75; July 15—103.125; July 18—103.50; July 19—103.75*.

*Estimates.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	26.00	24.70	12/17/59
Aluminum ingot	28.10	26.80	12/17/59
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	33.00	35.00	3/11/60
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	11.80	12.30	12/21/59
Lead, N. Y.	12.00	12.50	12/21/59
Magnesium ingot	36.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/56
Titanium sponge	150-180	162-182	8/1/59
Zinc, E. St. L.	13.00	12.50	1/8/60
Zinc, N. Y.	13.50	13.00	1/8/60

ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic, (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; **Other primary prices, pg. 199.**

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.038	.048-.061	.077-.096	.136-.250
1100, 3003	47.8	47.3	46.2	45.1
5052	54.2	53.0	50.8	49.2
6061-0	51.0	49.8	47.9	46.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	44.7-46.2	53.2-60.8
18-32	45.2-46.8	57.7-79.9
33-38	48.8-51.4	83.3-94.5
39-44	58.7-62.4	99.9-121.0

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	.....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	.....	48.68	58.78
Muntz Metal	53.20	.....	48.26	.....
Momm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	.....	52.21	.....
Phos. Bz. 5%	77.44	.....	78.10	.....

Free Cutting Brass Rod 36.06

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.50
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb) .... $1.50 to $1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 29.95 to 36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $2.25
Iridium, dollars per troy oz.... $75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $210 to $212
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz.. $24 to $26
Platinum, dollars per troy oz... $82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.)..... 91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 29.25
- No. 120 ..... 28.25
- No. 123 ..... 27.25

80-10-10 ingot
- No. 305 ..... 33.75
- No. 315 ..... 31.50

88-10-2 ingot
- No. 210 ..... 42.00
- No. 215 ..... 38.75
- No. 245 ..... 34.00

Yellow ingot
- No. 405 ..... 23.75

Manganese bronze
- No. 421 ..... 28.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 25.75-26.00
- 0.60 copper max. 25.50-25.75

Piston alloys (No. 132 type).. 28.00-29.00
No. 12 alum. (No. 2 grade)... 24.75-25.25
108 alloy 25.25-25.75
195 alloy 27.75-28.75
13 alloy (0.60 copper max.)... 25.75-26.00
AXS-679 (1 pct zinc) 25.00-26.00

Steel deoxidizing aluminum notch bar granulated or shot
- Grade 1—95-97½% 25.25-26.25
- Grade 2—92-95% 24.00-25.00
- Grade 3—90-92% 23.00-24.00
- Grade 4—85-90% 22.50-23.50

(Effective July 19, 1960)

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	22¼	20¼
Red brass	25⅜	25
Comm. bronze	26½	26
Mang. bronze	20¾	20
Free cutting rod ends.	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 27
- No. 2 copper wire 25
- Light copper 22¾
- *Refinery brass 23
- Copper bearing material 22

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 27¼
- No. 2 copper wire 24¾
- Light copper 22
- No. 1 composition 21
- No. 1 comp. turnings 20½
- Hvy. yellow brass solids 16
- Brass pipe 15
- Radiators 17

Aluminum

- Mixed old cast. ..... 13½—14
- Mixed new clips ..... 15 —15½
- Mixed turnings, dry ..... 14 —14½

Dealers' Scrap

(Dealers' Buying price f.o.b. New York in cents per pound)

Copper and Brass
- No. 1 copper wire ..... 23 —24
- No. 2 copper wire ..... 21 —21½
- Light copper ..... 19 —19½
- Auto radiators (unsweated).. 13 —13½
- No. 1 composition ..... 17½—18
- No. 1 composition turnings... 16 —16½
- Cocks and faucets ..... 13½—14
- Clean heavy yellow brass ... 12¼—12¾
- Brass pipe ..... 14 —14½
- New soft brass clippings .... 14 —14½
- No. 1 brass rod turnings .... 12½—13

Aluminum
- Alum. pistons and struts ..... 7½— 8
- Aluminum crankcase ..... 11¼—11¾
- 1100 (2s) aluminum clippings 15 —15½
- Old sheet and utensils ..... 11¼—11¾
- Borings and turnings ..... 7 — 7½
- Industrial castings ..... 11¼—11¾
- 2020 (24s) clippings ..... 12½—13

Zinc
- New zinc clippings ..... 7 — 7¼
- Old zinc ..... 4½— 5
- Zinc routings ..... 3¼— 3½
- Old die cast scrap ..... 2¾— 3

Nickel and Monel
- Pure nickel clippings 52-54
- Clean nickel turnings 40
- Nickel anodes 52-54
- Nickel rod ends 52-54
- New Monel clippings 28-29
- Clean Monel turnings 20-23
- Old sheet Monel 24-26
- Nickel silver clippings, mixed 18
- Nickel silver turnings, mixed 15

Lead
- Soft scrap lead ..... 8 — 8¼
- Battery plates (dry) ..... 3 — 3¼
- Batteries, acid free ..... 2 — 2¼

Miscellaneous
- Block tin ..... 75 —76
- No. 1 pewter ..... 55 —56
- Auto babbitt ..... 39 —40
- Mixed common babbitt ..... 9¾—10¼
- Solder joints ..... 13¼—13¾
- Siphon tops 41
- Small foundry type ..... 9¾—10¼
- Monotype ..... 9¾—10¼
- Lino. and stereotype ..... 8¾— 9
- Electrotype ..... 7½— 7¾
- Hand picked type shells ..... 5¼— 5¾
- Lino. and stereo. dross ..... 2¼— 2¾
- Electro dross ..... 2¼— 2¾

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Castle, Pa.									7.425* *M8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective July 19, 1960)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3,W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3,Y1*	6.275 *U1, I3,Y1*	6.875 *U1, I3*	6.775 *U1, I3,Y1*	7.225 *U1*	7.525 *U1, Y1,I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1,Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3,P6*	6.275 *U1, J3,P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3,P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3,W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Pontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2,R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

? Electrogalvanized sheets.

(Effective July 19, 1960)

*7.425 at Sharon-Niles is 7.225

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, B5*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective July 19, 1960) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore**	$.10	8.37	9.71	10.16	10.78	8.94	9.63	9.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		8.46	10.20	10.69	9.45	8.41	8.47	8.26	13.14	16.76	.....	.....	.....
Boston**	.10	9.84	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	8.95	10.10	11.30	10.80	9.15	9.80	9.15	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.72	10.35	10.30	10.89	8.56	9.06	8.99	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	8.89	10.41	10.35	11.21	8.94	9.62	9.31	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.72[1]	10.13	11.39	11.01	8.80	9.45	9.11	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit**	.15	9.15	10.61	11.45	10.92	9.19	10.04	9.30	11.16	17.38	16.38	21.48	20.73
Houston**		9.22	9.65	12.19[3]	10.78	8.95	8.86	8.63	13.10	17.50	16.55	21.55	20.85
Kansas City**	.15	9.36	11.02	11.50	11.02	9.25	9.95	9.46	11.72	17.17	15.87	21.87	21.12
Los Angeles**		9.59[1]	11.29	12.20	11.29	9.82	10.54	9.67	14.20	18.30	17.35	22.90	22.20
Memphis**	.15	9.99	10.20	.....	11.39	10.27	10.48	10.07	12.89	.....	.....	.....	.....
Milwaukee**	.15	8.86	10.49	10.44	11.03	8.70	9.28	9.13	11.04	17.24	16.24	21.24	20.49
New York	.10	9.46	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.48	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia**	.10	8.95	9.70	10.76	10.95	9.30	9.95	9.35	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	8.72	10.13	11.28	10.99	8.56	9.06	9.00	11.40	17.10	16.10	19.70	20.45
Portland**		10.20	12.05	12.35	12.20	10.35	10.80	10.20	16.65	18.50	17.45	20.75	20.25
San Francisco**	.10	10.27	11.79[2]	11.55	11.88	10.48	10.50	10.17	15.20	18.30	17.35	22.90	22.20
Seattle**		10.07	11.44	12.05	11.84	10.17	10.50	9.96	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	10.07	11.44	12.05	11.84	10.17	10.50	9.96	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	8.92	10.75	10.68	11.09	8.77	9.29	8.97	11.43	17.48	16.48	21.58	20.83
St. Paul**	.15	8.99	9.74	10.99	11.16	8.83	9.33	8.97	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—¼" x 1": Plate—½" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅛" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective July 19, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — Pct

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — Pct

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Add 7½ pct for nuts assembled to bolts)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46

Machine Screws—bulk

¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

F.o.b. mills

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective July 19, 1960)

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25 31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	43.75	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* wensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld	Merch. Wire Galv.
	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	...	...	...	...	...	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	...	...	...	...	...	9.00	9.55
Cleveland *A6*	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	9.00	...
Crawf'dsv. *M4***	175	193	...	214	199	9.10	9.85
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	...	...	...	...	...	...
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	...	...	...	...	...	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass *W6*	...	...	...	...	...	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.95	10.50
Rankin Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	...	...	...	236	...	9.95	10.50
SparrowsPt. *B3***	175	...	...	215	198	9.10	9.775
Struthers, O. *Y1**	...	...	...	...	...	8.65	9.20
Worcester *A5*	179	...	...	...	...	9.30	9.85
Williamsport *S5*	...	...	...	...	...	...	...

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ in.		¾ in.		1 in.		1¼ in.		1½ in.		2 in.		2½-3 in.		2 in.		2½ in.		3 in.		3½-4 in.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

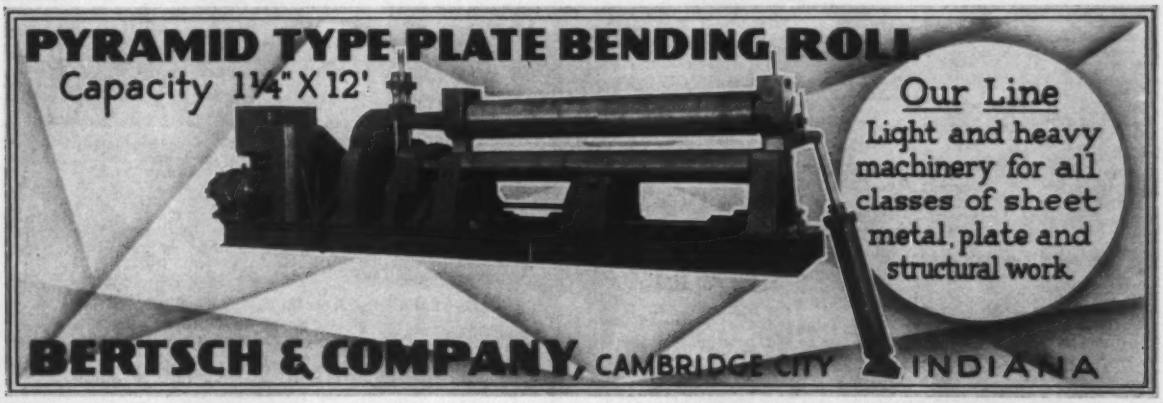
CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	139.8
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 4 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	32.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville, Ia., Pa.	30.75


PYRAMID TYPE PLATE BENDING ROLL
Capacity 1¼" X 12'
Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work.
BERTSCH & COMPANY, CAMBRIDGE CITY INDIANA

ARMSTRONG *Drop Forged*
HOIST HOOKS
Correctly engineered, drop forged and heat treated. Strong—max. load is 4 times rated "safe work load"; elastic limit approximately twice rated load. Inside hook sizes from ¾" to 4". Capacities ½ to 25 tons.
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FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	32.75
0.05% C....	33.50	1.00% C....	32.50
0.10% C....	33.25	1.50% C....	32.25
0.20% C....	33.00	2.00% C....	32.00

4.00-4.50% C, 60-70% Cr, 1.2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 28.25
0.025% C (Simplex) 31.50
5-7% C, 61-65% Cr, 5-8% Si 22.00
5% max C, 50-55% Cr, 2% max Si.. 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.
0.10% max. C $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.
Carloads $1.15
Ton lots 1.17
Less ton lots 1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.
Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	24.50	14.60
Ton lots	29.75	16.05
Less ton lots	31.35	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.
Carloads, bulk 24.00
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads, bulk 23.00
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.
Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots 18.45
Ton lots 19.95
Less ton lots 21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload bulk 19.20
Ton lots to carload packed 21.15
Less ton lots 22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.00
Houston, Tex.	11.00
Johnstown, Pa.	11.00
Lynchburg, Va.	11.00
Neville Island, Pa.	11.00
Sheridan, Pa.	11.00
Philo, Ohio	11.00
Rockwood, Tenn.	11.00
S. Duquesne	11.00

Add or substract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:
Carloads, bulk 13.70
Ton lots packed in bags 16.10

Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

Mn	Palmerton, Pa. 10 lb, pig	35 lb, down	Neville Is., Pa. 35 lb
16-19% ..	$98.00	$96.00	$100.50
19-21% ..	100.00	98.00	102.50
21-23% ..	102.50	100.50	105.50

Manganese Metal

2 in. x down, cents per pound of metal delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
Carloads, bulk 34.25
Ton lots, palletized 36.25
250 to 1999 lb 39.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 24.00

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk) P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C.	31.10	33.90	35.10
0.30% max. C	29.80	32.60	33.80
0.50% max. C	28.50	31.30	32.50
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	27.00	29.80	31.00

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.
Carloads bulk 11.60
Ton lots, packed 13.25
Carloads, bulk, delivered, per lb of briquet 14.00
Briquets, packed pallets, 2000 lb up to carloads 16.40

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe..	22.95	21.65
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.
Carloads, bulk 8.00
Ton lots, packed 10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
		90% Si....	20.00

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.
Openhearth 3.20
Crucible 3.30
High speed steel 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb..	2.40	3.30	4.55

(Effective July 19, 1960)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.
Carloads, bulk ..... 9.85¢
Ton lots ..... 11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 58-62% Cb, 2 in. x D, delivered per pound
Ton lots $3.45
Less ton lots 3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $255.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.
Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound ..... 30¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.. $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb and over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
Ton lots (packed) $1.46
Less ton lots (packed) 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

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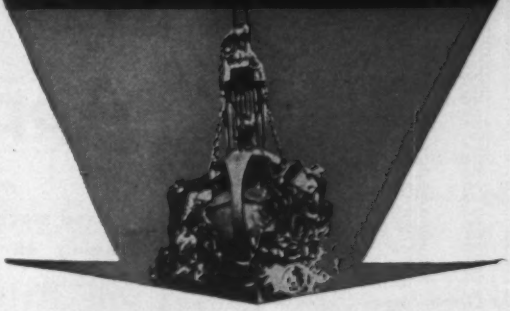

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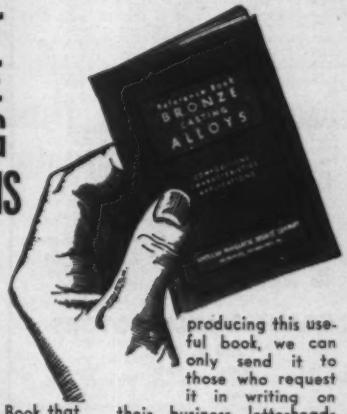

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DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	New G.E.	Enc. S.V.	475	320
1	3000	New Whse.	Enc. F.V.	525	600
2	2700	G.E.	Enc. S.V.	415	280
1	2250	New G.E.	Enc. S.V.	600	200/300
1	2200	G.E.	Enc. S.V.	600	400/500
2	2000	G.E.	Enc. S.V.	350	230/350
2	1750	G.E.	Enc. S.V.	250	175/350
2	1500	Whse.		600	300/700
4	1500	New Whse.	Enc. F.V.	525	600
2	1400	G.E.	MCF	250	165/300
1	1300	G.E.	MCF-12	300	200/400
1	1200	G.E.	MCF	600	450/600
1	1000	Whse.		500	800/2000
4	1000	GM	DS	600	600/900
2	900	G.E.	MCF	250	180/360
1	850	G.E.	MCF	250	85/170
2	800	G.E.	MCF	250	400/750
2	800	G.E.	MCF	250	780
2	750	G.E.	MCF	600	450/900
1	750	G.E.	M.F.	600	120/360
2	645	S.S.	V.G.	300	1000
4	600	Whse.		250	275/550
1	500	G.E.	MPC-10	250	188/400
2	450	Whse.		550	415
4	400	G.M.	DS	250	300/900
2	400	G.E.	CY-275	300	1000/1500
1	300	Cr.Wh.	H-102 B.B.	230	1200
1	150	Cr.Wh.	CMC-65H	230	1150
1	150	G.E.B.B.	CD	600	250/750
1	150	G.E.B.B.	CDP-125	230	1750
1	125	Cont. B.B.		230	1750
1	100	G.E.	CDP-115	230	1750
1	80	Whse.	SK-123.9	240	2000-4500
1	75	G.E.B.B.	CD-1235-D.P.	600	850

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MG SETS—3 Ph. 60 CY.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	4800	G.E.	450	300	2300/4600
1	2400	G.E.	450	300	2300/4600
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
1	1750	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	Cr.Wh. 4 unit	720	100	2300
1	1000	G.E.	900	600	2300/4000
1	1000	G.E.	720	250	2300/4150
1	1000	G.E.	900	260	4000/6900
1	500	G.E.	900	125/250	440
1	500	G.E.	900	250	2300/4600
1	500 (New)	G.E.	1200	300	2300
1	350	G.E.	900	125	440/2300/4160
1	300	G.E.	1200	250	2300/4000
1	300	G.E.	1200	250	440/2300
1	250	G.E.	900	250	440/2300
1	240	Whse.	900	125	220/440
1	200	Whse.	1200	550	2200
1	200	El. Mhy.	1200	250	2300/4600
1	150	G.E.	1200	275	2300
1	150	Whse.	1200	275	2300
1	150	G.E.	1200	125	440
	140	Cr.Wh.	690	125/250	2300
1	100	G.E.	1170	250	220/440
2	100	Cr.Wh.	81160	525	220/550
1	100	G.E.	1200	250	2400/4100
2	75	Whse.	1200	125	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
3	3333	Whse.	OISC	1	13800 x 2300
1	3000	A.C.	OISC	3	34500 x 2300
3	1000	G.E.	OA/FA	1	13800 x 230/460
3	833	A.C.	OISC	1	4800/2400 x 480
3	833	A.C.	OISC	1	16175/13475 x 2300/4000
2	750	G.E.	Pyranol	1	4800 x 85/55-255/165
3	500	Mal.	C	1	6600/11430Yx480
3	500	Kuhl	OISC	1	13200 x 6600
3	150	G.E.	OISC	1	33000x2300/4000Y
3	167	G.E.	HS	1	13800 x 240/480
3	100	G.E.	HS	1	4800/8320Y x 120/240

CRANE & MILL MOTORS

230 V. D. C.

Qu.	H.P.	Make	RPM	Type
12	12/14	Whse.	700/600	MCA-30, Series
1	20	Whse.	975	K-5 Series
2	23	G.E.	650	MDS-408 Shunt
1	35	Whse.	480	CK-9 Comp. S.B.
1	35	Whse.	480	CK-9 Sh. R.B.
1	45	Whse.	600	CK-9 Comp. S.B.
3	50	G.E.	650	COM-1830 Comp.
2	50	Whse.	525	CK-9 Shunt R.B.
2	50	Whse.	600	CK-9 Comp. R.B.
1	50	G.E.	525	COM-1830AEB.B.
1	50	Cr.Wh.	510	SW-50 Comp.
9	12, 45	G.E.	625/575	CO-1832 Ser.
1	100	G.E.	475	CO-1832 S.B.
6	100-140	Whse.	500/415	MC-90 R.B.

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West Coast Dealers Appear Optimistic

Used machinery prospects are hinging on additional defense spending.

Northern California dealers say business leaves much to be desired. Inquiries outnumber action.

■ What's the used machinery outlook on the West Coast?

In southern California, dealers look for a healthy stepup in business within five or six weeks.

They generally agree on this: The Democrats and Republicans will do a lot of talking about more defense spending. No matter who's elected to the Presidency, it's clear to many metalworking firms that more money is going into the defense pot.

Hundreds of companies tied to the defense dollar will begin adding to equipment. Apparently, sales are looming for circular turning equipment: boring mills, lathes, and heavy duty surface grinders.

Moderate Sales—Right now, machine tools in the heavier sizes sell moderately well. But dealers expect a substantial pickup. Best sellers today are engine lathes for tracer attachments and sheet metal equipment.

Dealers believe they have enough machinery on the floor to take care of the new business. But it's understood that they'll have to hustle to find some of the heavier equipment. In the past, a promising sales pace usually sent dealers scurrying for tools in eastern markets.

The IRON AGE also spot-checked northern California dealers. They say business leaves much to be desired. Prices on older equipment — 15 years old or so — are being slashed as much as 50 pct.

Nothing seems particularly hard to get. One dealer claims some good used machinery still brings as much as 70 to 80 pct of its new price. He reports lathes, drills, and mills are the main moving items. No one reports buying anything from the East. "The freight kills you," an executive says.

A Sharper Drop—Another dealer reports an even sharper drop in prices. He cites a rough time trying to sell a "fairly good quality" milling machine for $6500. Eighteen months ago, he says, this tool would easily bring $14,000 to $15,000.

Another example is a good universal grinder, 10 years old, that bears a $28,000 tag when new, is having a hard time selling for $11,000 or $12,000.

That, the dealer says, is even after offering a 90-day trial.

Most firms indicate there's a considerable number of inquiries—but "no action." Most feel money is no particular problem.

What happened to business?

Typical Cycle — One executive claims that the present situation is merely part of the cycle typical to the machinery business. It started about eight months ago. He looks for better times as the second half gets further underway.

"We need better salesmen who will do a better and more aggressive selling job. The day of the order taker is past," one dealer states.

For the dealer with money, this is a good time to stock up, another executive suggests. "There are good buys around—and business is bound to get better soon."

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1—25" & 42" x 66" HOT STRIP MILL, 4-high.
1—3½" & 8½" x 5½" STRIP MILL, 4-high.
2—28" 3-HIGH ROLL STANDS.
1—18" 3-HIGH BAR MILL, single stand.
1—NEW 16" BAR MILL, 3-high, single stand.
1—10" BAR MILL with motor and gear drive.
1—9" BAR MILL 3-high five stands.
1—34" x 192" ROLL GRINDER.
1—450 TON DOWN-CUT CROP SHEAR, 14" stroke, length of knives 28"
1—OPEN SIDE BAR SHEAR Williams & White No. 14½, 1¾" round.
1—SHEAR, 1" x 110" plate.
1—LEVELLER, 1" x 104" plates.
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1—SIDE TRIMMER, Strains, maximum width 48" makes 2 cuts 3/16" mild steel.
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1—1500 HP GEAR DRIVE, 7.5 to 1 ratio.
1—1200 HP GEAR DRIVE, 295 to 30 RPM.
1—1200 HP GEAR DRIVE, 353 to 94.5 RPM.
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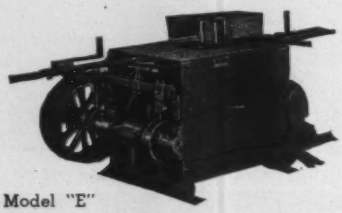

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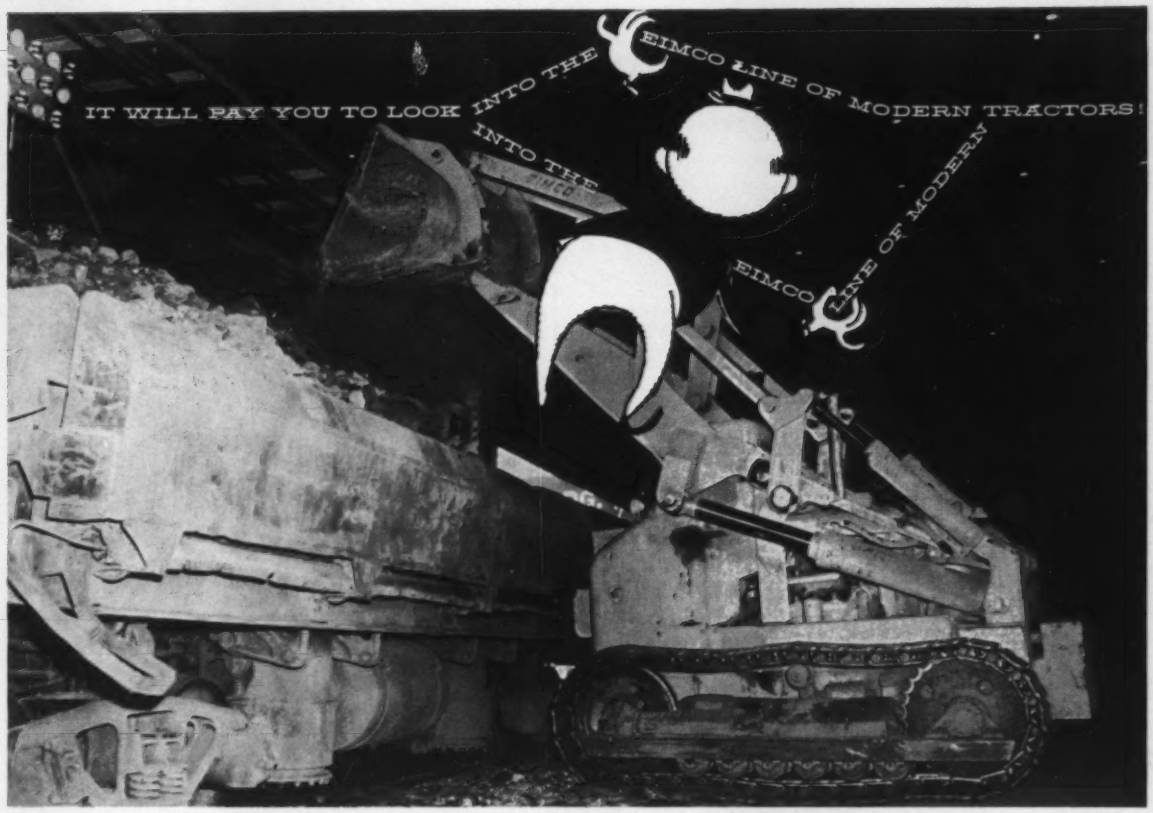

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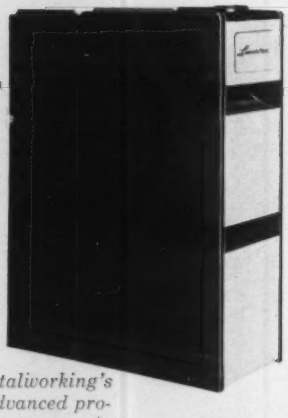

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Seven of Olsen's seventeen Verson Press Brakes. From left to right, the operations being performed are: (1) notching and piercing furnace door braces; (2) punching fan ring; (3) bending and flattening furnace side panel; (4) roll operation on side panel; (5) four right angle bends on front panel; (6) four right angle bends on air baffle; (7) punching condenser support.